Universidad de Alcalá

Comunidad de Madrid
Dirección General de Investigación e Innovación Tecnológica
CONSEJERÍA DE CIENCIA, UNIVERSIDADES E INNOVACIÓN

CATALOGUE

Scientific and Technological Offer

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Scientific and Technological offered Areas- UAH

CATÁLOGUE

Agro-food

Health Sciences

Construction and infraestructure

Economy and society

Industry and transport

Environment and energy

Chemistry and materials

Tic´s

Agro-food

- Procedure for obtaining peptides with antioxidant and antihypertensive properties from olive seds
- Via led-lighting automated control and supervision system for pharmacautical manufacturing environments
- Sensograph: fast and cheap method for the sensory food positioning
- Novel method for the detection of adulteration of saffron with gardenia
- Device for taking pictures of the treetops

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PROCEDURE FOR OBTAINING PEPTIDES WITH ANTIOXIDANT AND ANTIHYPERTENSIVE PROPERTIES FROM OLIVE SEEDS

Patent
ES2487115 y
ES2489440

Code

AGR_UAH_09

Application areas

- Biological Sciences
- Agriculture and Marine Resources
- Agrofood Industry

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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ABSTRACT

The proposed chemical procedure allows obtaining a peptide extract with antioxidant and antihypertensive capacity from olive seeds.
The procedure requires the prior extraction of proteins following a previously optimized method, and enzymatic hydrolysis of the extracted proteins. The extraction of the proteins contained in the olive pit is performed using a Tris-HCl buffer at pH 7.5 containing sodium dodecyl sulfate and dithiothreitol. Then, the extracted proteins are purified by precipitation with acetone. The isolated proteins are dissolved in an alkaline medium and it is carried out the hydrolysis using Alcalase or Thermolysin enzymes at controlled temperature and with agitation. After the digestion, the enzyme is inactivated and the supernatant containing peptides with antihypertensive or antioxidant capacity, is separated by centrifugation.
Comparing the results with those obtained for a control compound with recognized antioxidant capacity demonstrates that hydrolysates obtained are interesting sources of peptides with antioxidant properties. Through this procedure, it is described a use alternative of a waste material such as olive pits and that until now it was not performed. Compared with other use forms of this residue, this method allows the revaluation of this cheap source of protein.

ADVANTAGES AND INNOVATIONS

- First proposed procedure for industrial waste use of the olive processing to obtain peptide with bioactive properties.
- The procedure of the invention is simple, inexpensive, fast and safe, because it uses basic instrumentation and a commercial enzyme widely used in the food industry.
- It is a cheap source of compounds with high biological value solving the problem of the produced use of waste during the production of table olives and olive oil.

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VIA LED-LIGHTING AUTOMATED CONTROL AND SUPERVISION SYSTEM FOR PHARMACEUTICAL MANUFACTURING ENVIRONMENTS

TECHNOLOGY OFFER

Code

AGR_UAH_10

Application areas

- Other Industrial Technologies

Type of collaboration

- Commercial agreement with technical assistance

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ABSTRACT

Control and supervision of critical environmental variables in pharmaceutical manufacturing processes, are done using programmable logic controllers and last generation industrial communication buses. These variables can include, among others, atmospheric pressure, ambient temperature and relative humidity of each of the rooms of a manufacturing plant. This control is combined with the opening and closing information from all the factory doors.
In certain critical or sterile areas, it is possible to selectively lock the doors avoiding air flows to introduce impurities into the security zones.
Along with the control system, a monitoring system that reports graphically and in real time the state of all variables and rooms is included. This supervision subsystem allows the performance of operators for changing the target values, as well as, the modification of the exclusion zones depending on the particular manufacturing process carried out. Simultaneously, a continuous record of all variables and updates is performed for the analysis, reporting, and verification required by the quality control procedure.
Finally, the entire system can set an alarm module, which generates immediately warnings related to critical limits of the variables recorded.

ADVANTAGES AND INNOVATIONS

- The project is implemented on the latest technology available in industrial automation. Both programmable logic controllers employed and implanted communication buses constitute a novel solution. It enables the integration of manufacturing work, maintenance and quality control reliably.

- Automated control and supervision of an industrial manufacturing process improves the quality of products, allowing greater repeatability of the procedures and facilitating the work of supervision. All of this will increase production with significant cost savings. Likewise, the maintenance is simplified, reducing downtime and identification and replacement of damaged items.

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SENSOGRAPH: FAST AND CHEAP METHOD FOR THE SENSORY FOOD POSITIONING

TECHNOLOGY OFFER

Code

AGR_UAH_11

Application areas

- Physics and Exact Sciences
- Agrofood Industries
- Other Industrial Technologies

Type of collaboration

- Commercial agreement with technical assistance
- Technical Cooperation

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	1	2	3	4	5	6	7	8	9
1	-	20	13	46	81	15	15	21	16
2	20	-	28	80	15	12	16	70	15
3	13	28	-	12	35	34	66	27	50
4	46	80	12	-	34	16	16	51	16
5	81	15	35	34	-	28	23	19	26
6	15	12	34	16	28	-	58	18	46
7	15	16	66	16	23	58	-	22	50
8	21	70	27	51	19	18	22	-	26
9	16	15	50	16	26	46	50	26	-

Tabla con el número de conexiones entre cada par de muestras. Se observa que la conexión 1-5 aparece para 81 de los 100 usuarios totales, siendo el par de productos que más se identifican. Le sigue muy de cerca el par 2-4, considerados similares por 80 de los 100 usuarios.

Imagen global de los nueve productos considerados, tras consultar a todos los catadores. Se observan claramente tres grupos, por un lado, el par 1-5, por otro lado, el grupo 2-4-8 (donde la conexión 4-8 es menos intensa), y finalmente el grupo 3-6-7-9.

ABSTRACT

Sensograph is a new method for sensory positioning based on the opinions of a group of untrained tasters and / or consumers, processed by software that uses geometric techniques rather than statistics.

The tasters training for conventional methods can be lengthy and costly. The technique proposed here only requires a group of tasters, not necessarily trained, and / or consumers who place the products on a sheet according to how similar they perceive them. Sensograph encodes the relative positions between the points using proximity graphs to identify the similarities that each taster has perceived among the different products offered. Finally, computational geometry techniques are used to fuse in one, all the mental images perceived by different tasters.

The software developed has proved its utility in multiple tastings, performed by experts in sensory analysis. They have shown the similarity of the results with those obtained by statistical techniques, as well as the quality/ price ratio of this method, compared to the training and coaching of a panel of expert tasters.

ADVANTAGES AND INNOVATIONS

Statistical techniques usually require specific knowledge for correct use. The method proposed here uses easily understandable geometric concepts, so it can be used by anyone with basic training, without the need for experience or training in the use of statistical techniques.

In addition, the characteristics of the method make it possible, without more tool than a simple smartphone, to perform the data capture and its processing in real time.

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NOVEL METHOD FOR THE DETECTION OF ADULTERATION OF SAFFRON WITH GARDENIA

Patent
ES2631834 A1

Code

AGR_UAH_12

Application areas

- Other Industrial Technologies
- Agrofood Industry
- Measurements and standards

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

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ABSTRACT

The object of the invention is the development of a procedure for the detection of adulterations of saffron with gardenia based on the detection of geniposide by High Performance Liquid Chromatography with Tandem Mass Spectrometry detection. The presence of "geniposide" in gardenia and its absence in saffron allows proposing this compound as a marker of adulterations of saffron with gardenia.

The procedure is based on the use of a Liquid Chromatography (LC) equipment coupled to a Tandem Mass Spectrometry (MS/MS) detector that uses a very sensitive and unambiguous method for the detection of geniposide in samples of saffron despite of being in almost negligible proportions.

It is of interest to the food sector for its potential to control the quality of saffron and avoid economic fraud.

ADVANTAGES AND iNNOVATIONS

- It allows to separate the geniposide peak of the rest of the components of the saffron in a time less than 2 minutes.
- It allows to detect unequivocally the adulteration of saffron with gardenia through the determination of geniposide.
- The use of geniposide as a marker of adulterations of saffron with extracts of gardenia allows to perform a quality control of the saffron and to detect adulterations of saffron with gardenia in a sensible and unequivocal way.
- It allows to detect up to 0.004 % of geniposide in saffron making it a very sensitive procedure.

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DEVICE FOR TAKING PICTURES OF THE TREETOPS

Patent
ES2530887 A1

Code

AGR_UAH_13

Application areas

- Agriculture and Marine Resources
- Environment and risk prevention

Type of collaboration

- Commercial agreement with technical assistance
- License agreement

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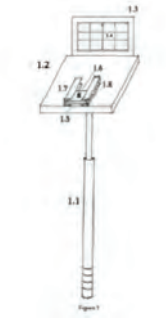

ABSTRACT

Observation of tree crowns is necessary to quantify the production of organs (leaves, flowers, fruits, seeds, buds, branches, etc.), which is relevant in both agroforestry and forestry studies and in science basic studies. Direct observation techniques are also used for the quantification of damages caused at an individual level, by pests or adverse atmospheric agents.
The device consists of an extendable pole to which a horizontal platform with a transverse rectangular frame is anchored at one end, and a movable metal plate with an imaging device, at the other. The device is operated from the ground and allows the angle of the platform to be adjusted by means of an elbow located at its bottom and the distance from the device to the reference frame by means of a movable metal plate.
The device therefore allows to raise a camera of photos or video at the height of the treetop to make the necessary observations. This ensures a perfect take of the images without having to destroy part of the tree or to climb to the top of the tree.
The device ensures an adequate stability for the taking of the images or videos and allows a regulation of the height of observation, as well as the angle of the camera or video to adapt to a wide range of heights of more than two meters.

ADVANTAGES AND INNOVATIONS

- This new method, allows to make the observations that are considered necessary as it is not invasive.
- It ensures with him, a perfect taking of the images without having to destroy part of the treetop or to climb to that heights.
- The device ensures an adequate stability for the taking of the images or videos and allows a regulation of the height of observation, as well as the angle of the camera or video.
- The device is especially useful for specimens whose height does not allow direct observation by a person from the ground. Because the image is taken referenced to a known surface (rectangular wooden frame area), images taken from different specimens can be compared, thus comparing the efficiency of different silvicultural or agricultural treatments (phytosanitary treatments, subscribers, irrigation, etc.) on the state of health and productivity of the different individuals.

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Health sciences

- Estimated energy model based in quantitative structure-activity relationships (3D QSAR)
- Anticancer activity of ru (II) arene complexes complexes with oxime ligands
- Pyridazino[2,3-A]pyrrolo[2,1-C]quinoxalinium salts for the treatment of leishmania infections and diseases that involve the protein tyrosine phosphatise 1B
- Technoligies for the improvement of the mobility of people with motor affectation
- Walker for the mobility of people with motor disability
- Location system and navigation assistance for blind people, using artificial vision
- Device and method for ventricular repolarization alternans detections by windowing
- New therapeutic agents for the treatment of inflamatory disorders
- Double port injector to corneal transplant DMEK
- Carbosilane dendrimers with polyphenolic groups. Uses as antioxidants and anticancer
- Method of diagnosis of non-invasive renal failure and prior to symtoms and functional disorders
- New inhibitor compounds of the tyrosine phosphobase 1B protein
- Carbosilane dendrimers and their use as antivirals
- Carbosilane dendrimers with a polyphenolic nucleus and their use as antivirals
- Derivates of indolin-2-one and its therapeutic use in inflammatory, autoinmune, metabolic, cardio-vascular, neurological, and cancer diseases
- Carbosilane dendrons functionalized with fatty acids: formation of micelles and uses in biomedicine as antiviral, antibacterial, antiprionic, antimicrobial and drug transporters
- Nanoconjugates formed by dendritic molecules and peptides as antitumor agents against advance prostate cancer
- Compounds for the treatment of leishmania infections
- Carbosilane metallodendromers containing ruthenium and copper ions coordinated to schiff base ligands, their preparation and us
- Drug formulation and biodisponibility

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ESTIMATED BINDING ENERGY MODEL BASED IN QUANTITATIVE STRUCTURE-ACTIVITY RELATIONSHIPS (3D QSAR)

TECHNOLOGY OFFER

Code

BIO_UAH_01

Application areas

- Biological Sciences

Type of collaboration

- Technical cooperation
- Commercial agreement with technical assistance

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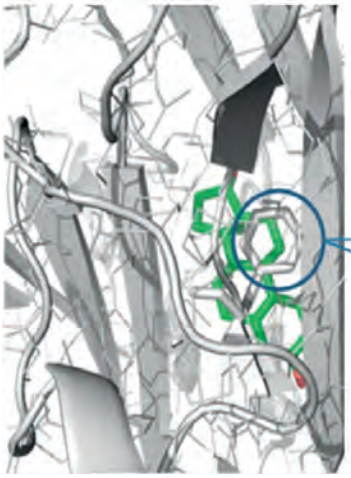

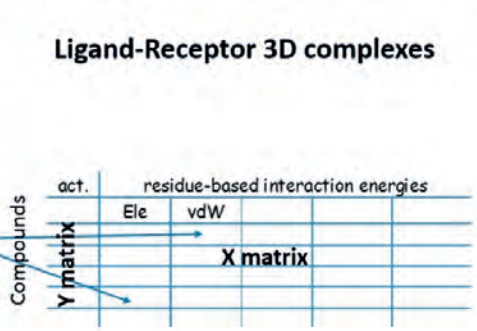

ABSTRACT

The biological activity of a compound depends greatly on its interaction energy with the receptor and so the accurate estimation of the compound's interaction energy is really important to predict a priori the activity of novel compounds before their synthesis. Unfortunately, even knowing the structure of the compound, the interaction is difficult to estimate.

To solve problems with series of interrelated compounds, a simpler model of interaction energy and its molecular mechanism can be built. This model called COMBINE (Combine Binding Energy) analysis is mainly based on the 3D QSAR method (Quantitative Structure-Activity Relationships) which uses receptor-ligand complex structures. The receptor-ligand interaction energy is computerized in AMBER molecular modelling programs. Residual contributions were considered with estimations of the electrostatic contribution of the ligands and receptors desolvatation with biological activity, using a continuous method. Due to the regression analysis PLS (Partial Linear Least Squares Regression Analysis) all the energy values relate to the biological activity.

ADVANTAGES AND INNOVATIONS

One of the most important competitive advantage is the possibility to predict and evaluate the interaction energy of a new compound with its biological target before its synthesis, as well as the possibility to quantify the structure-activity relations in analogous series. Equally, it is possible to build, visualize and optimize molecules with pharmacologic potential and to model by homology macromolecular structures which are still not experimentally available.

- Combine Binding Energy (COMBINE) is used to determine the effect of incorporating the dissolvent.
- It is used as a powerful design tool in receptor drugs.
- COMBINE could determine the electrostatic contribution to binding free energy between a ligand (L) and a receptor to form the complex L-R in the presence or in the absence of a dissolvent.

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CARBOSILANE DENDRITIC COMPOUNDS HOMO AND HETEROFUNCTIONALIZED

Patent
ES2444490

Code

BIO_UAH_05

Application areas

- Biological Sciences

Type of Collaboration

- Technical cooperation
- Comercial agreement

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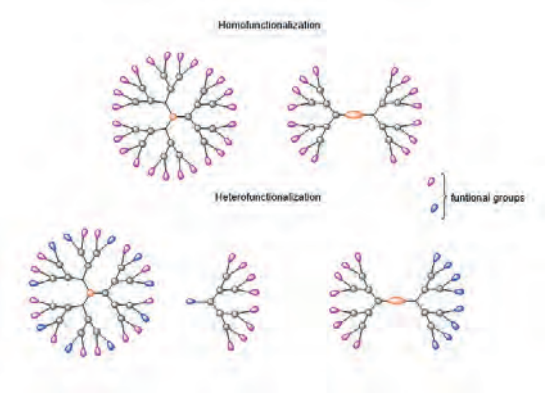

ABSTRACT

The present invention provides highly branched macromolecules, dendrimers or dendrons, of carbosilane structure and its periphery functionalized with anionic groups (such carboxylate, sulfonate or sulfate), that give the macromolecule a net negative charge or cationic (ammonium) giving the dendrimer a net positive charge. Preferably the dendrimers have a polyphenol or silicon atom nucleus. The procedure for preparing the compounds of the invention allows, through a simple process, the versatility in the synthesis of dendrimers or dendrons, with anionic or cationic nature, and also the possibility of synthesizing dendrimers or dendrons heterofunctionalized which consists on the above molecules but with one or more of its branches replaced with different groups such as chromophore, targetting groups or others with therapeutic activity.

The present invention includes not only the compounds per se, but any of its salts, for example alkaline metal salts or alkaline earth metal. For example it may be selected from sodium, potassium or calcium salts. Therefore, the present invention provides dendritic compounds, dendrimers or dendrons, which also contain groups that provide a number of useful properties in biomedicine and can introduce in its outer layer at least one group with different functionality to produce a multifunctional compound with great versatility in their application.

In a preferred procedure, the compound of the invention may be a dendrimer or dendron of first, second, third or fourth subsequent generation. The term "generation" refers to the number of iterative ramifications that are necessary for the compound preparation. Another aspect of the present invention relates to a method of preparing the compounds of the invention which comprises a thiol-ene or thiol–yne reaction, between a precursor of that compound with olefins or terminal alkynes, respectively, and the thiol group.

ADVANTAGES AND INNOVATIONS

- Versatility in the synthesis of cationic or anionic dendrimers and dendrons.
- Possibility to synthesize heterofunctionalized dendrimers or dendrons.
- Possibility of using carbosilane dendrons for the functionalization of other systems, such as nanoparticles, carbon nanotubes, etc.
- The compounds play more than one role simultaneously.
- The compounds are stable and soluble in water in their ionic forms and can be isolated with a high performance.

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ANTICANCER ACTIVITY OF RU (II) ARENE COMPLEXES WITH OXIME LIGANDS

Patent
ES2533653

Code

BIO_UAH_07

Application areas

- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreementt

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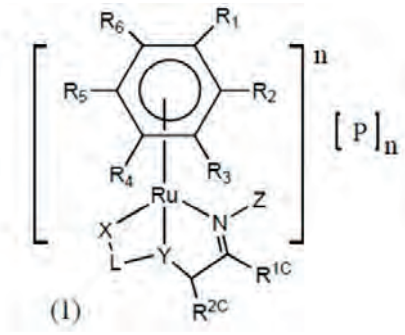

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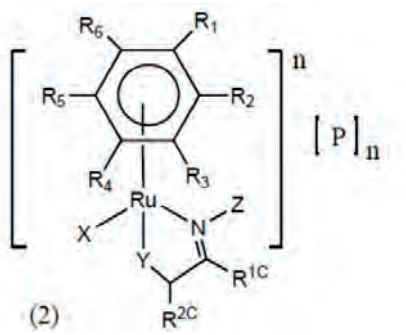

(2)

ABSTRACT

The invention describes the efficient antitumor activity of Ru (II) complexes and their enhanced cytotoxic action relative to that found for the organic and inorganic starting products.
The complexes studied show an excellent antitumor activity against the human prostate adenocarcinoma cell line, with a dose of 10-15µM at short incubation times (3 hours). They have also demonstrated antimetastatic capacity in adhesion and migration in vitro tests.
The synthetic reactions leading to the ruthenium compounds occur in mild conditions of pressure and at room temperature. The complexes are stable and soluble in aqueous media.
The complex subject of this study are derivatives of the formulas (1) and (2) (additional information), or solvates or precursors of them.
For (1) and (2), from R1 to R6 may be halide, H may be alkyl or aryl functionalized or without being functionalized. R1 and R2 may also be part of a saturated or unsaturated carbon or heterocyclic ring of 3 to 8 members. P is a contra anion. The n may be 0, 1 or 2. The Z may be OH or OR. RC1 and RC2 may be H, alkyl, alkenyl or linear or branched, cyclic, heterocyclic or acyclic alkynyl, each of these may be or may not be differently substituted by each other.

ADVANTAGES AND INNOVATIONS

- The complexes described herein have high cytotoxicities after only 3 hours with IC50 not exceeding common levels. Also present antimetastatic capacity in in vitro assays adhesion and migration.
- The complexes are stable and soluble in aqueous media, thereby facilitating an easy release and distribution in the biological environment. Furthermore, these properties allow synthesis reactions to be carried out using low cost technologies.
- The complexes studied are obtained from simple synthesis reactions, using natural non-oil products such as terpenes, which are renewable, cheap and easily modifiable.
- Excellent, fast-acting in vitro antitumor properties. Can be used as drug for cancer treatment or prevention.

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PROTEIN SEPARATION BY USING ANIONIC CARBOSILANE DENDRIMERS

Patent
ES2417254

Code

BIO_UAH_08

Application areas

- Biological Sciences

Type of Collaboration

- Technical cooperation
- Comercial agreement
- License agreement

Main Researcher

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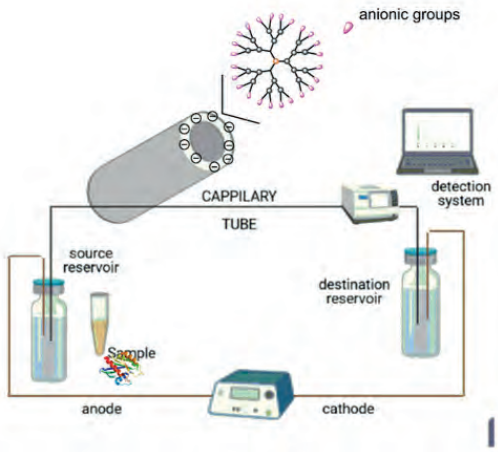

ABSTRACT

In the present invention carbosilane dendrimers are described with an inside constituted by carbon- silicon bonds and a negative charged surface, used for protein separation by capillary electrophoresis (CE) and a potentiometric assessment.
The use of the dendrimers of the present technology, that is dendrimers with carbosilane structure functionalized with anionic groups in the surface, is interesting since these systems have a hydrophilic surface due to negative charges of the terminal groups (COO-, SO3- o PO32-) and they lend water solubility, but at the same time they have a skeleton with hydrophobic character. The ambiphilic of these systems leads to interactions with proteins more efficient than the ones presented by anionic Starburst PAMAM dendrimers, since these dendrimers do not have this hydrophobic character.
Therefore the dendrimers used in the present invention are proposed as attractive nanoadditives for plant protein separation by electrokinetic chromatography (EKC) since they allow a clear improvement of the protein profiles. A first aspect of the present invention is referred to the use of anionic carbosilane dendrimer which includes:
- polyfunctional nucleus
- an external cape

ADVANTAGES AND INNOVATIONS

- Dendrimers are macromolecules with three-dimensional structures which have shown
- enormous applicability and whose main advantage is its versatility to modify its skeleton and surface.
- Dendrimers can interact with proteins and these interactions can lead to the formation of stable complexes.
- Carbosilane dendrimers with terminal anionic groups can be a very useful analytical tool to improve protein profiles to characterize samples of plant foods, since hydrophobic na- ture inside of the dendrimers can maximize the interaction of these systems with proteins to analyse and therefore improve their separation by CE.
- These profiles are a useful analytical tool for differentiation and classification of various foods.
- A very useful analytical tool.
- Clear improvement of protein profiles.
- More efficient interactions with proteins.
- Faster and higher separation efficiency.
- It is a cleaner technique because the sample and reagents consumption is much lower.

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PYRIDAZINO[2,3-A]PYRROLO[2,1-C]QUINOXALINIUM SALTS FOR THE TREATMENT OF LEISHMANIA INFECTIONS AND DISEASES THAT INVOLVE THE PROTEIN TYROSINE PHOSPHATISE 1B

Patent
ES2537221

Code

BIO_UAH_10

Application areas

- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreementt

Main Researchers

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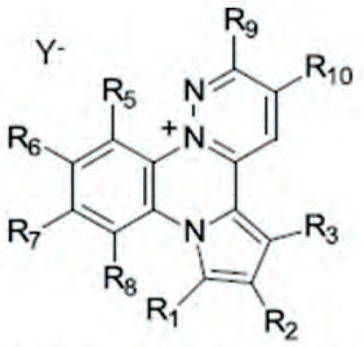

Estructura de nuevos compuesto de Fórmula I

ABSTRACT

The invention relates to the preparation of new compounds of Formula I as well as to the uses of these compounds to inhibit the growth and infection of the Leishmania parasite, which is an important new tool from the medical and veterinary point of views.
The invention also relates to the use of these compounds to inhibit PTP1B (protein belonging to the family of protein tyrosine phosphatases, PTPs).
The composition comprises at least one of the compounds of the invention together with a pharmaceutically acceptable carrier. The use of this composition for the treatment of infectious diseases is as a therapeutically effective amount. It can be prepared as a solid or aqueous suspension, in an acceptable pharmaceutically solvent and may be administered by a suitable administration route. The compounds of the invention are prepared from pirroloquinoxalines.
It can be used for the treatment of insulin resistance, glucose intolerance, obesity, diabetes mellitus, hypertension and ischemic diseases. Moreover, these compounds can be used in the treatment of cancer, osteoporosis, neurodegenerative and infectious diseases, and diseases involved with inflammation and the immune system.
The present invention also concerns the use of these compounds for the treatment of renal failure, myocardial infarction, ischemia, multiple sclerosis, neurodegenerative diseases or infectious diseases such as leishmaniasis.

ADVANTAGES AND INNOVATIONS

- High specificity for the Leishmania parasite.
- Possible new therapy for diabetes and obesity.
- As leishmanicidal, these compounds are highly selective. They can be used with other pharmaceuticals or additional active principles to provide a combination therapy.

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TECHNOLOGIES FOR THE IMPROVEMENT OF THE MOBILITY OF PEOPLE WITH MOTOR AFFECTATION

Patent
ES1138935 U
and
ES1104783 U

Code

BIO_UAH_11

Application areas

- Information and Communication Technologies
- Other Industrial Technologies
- Biological Sciences

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreementt

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Fig. 1: Andador

Fig. 2: Silla de ruedas eléctricas

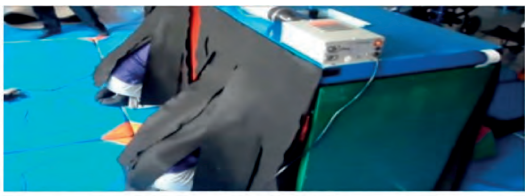

Fig. 3: Cabina multisensorial portátil

ABSTRACT

Walker for the improvement of the mobility of people with some motor affectation. This walker incorporates a guide for the legs that improves the maneuverability of the users, and also is accompanied by an electronic that allows the configuration of basic actions. The walker can be adjusted to the height of the child, allowing to configure different positions as well as adapting to the different weights of the user. The structu- re is made up of three distinct parts: a structure with wheels that provides stability, a harness with leg brace that supports the child and an electronics that provides fun- ctions added by software.

Portable multi-sensory cubicle that allows users with serious cognitive and / or physical conditions to receive an individualized multisensory stimulation.

It is easy to transport and store, and its structure of felts can isolate relatively the user. In this way, different methods of multisensory activation of the user are combined in an integrated way, providing him with auditory, optical and tactile stimulus.

The cubicle contains folding panels, felt pieces or opaque fabrics, an exterior decoration for tactile stimulation of the user, as well as an opening in one of the sides of the structure that allows to incorporate a tablet or digital device for the visual stimulation of the user. At the same time this tablet can be connected to a control electronics allowing amplification of the sound to act on the speakers and LEDs inside the cubicle. In addition, it is possible to interconnect several multi-sensory cubicles, just in case that it is desired to increase the size of the cubicle.

Electric wheelchair for children between 2-5 years of small size that allows the child to sit. It is characterized by its small size and it is easy to disassembly. It is supported on two axles with wheels, housing in the rear axle two electric motors that allow the mobility of the chair. In addition, the structure allows to accommodate the system of power batteries and a joystick that allows its control.

ADVANTAGES AND INNOVATIONS

- **Walker**: This walker allows to rotate in a relatively normal form, without forcing the patient to make exaggerated movements with the feet. For this, it contains guides in the design that transmits the lateral displacement almost immediately to the structure of the walker, as well as a development based mainly on flat pieces.
- **Electric chair**: The developed electric chair tries to cover the existing gap in this type of products for young children, on the other hand it has been complemented with a design that allows to place the Joystick in the front to be handling by the child or in the back to be controlled by an adult accompanying the child. On the other hand the bar that supports the Joystick can be removed to approach the classroom chair.
- **Multisensory cubicle:** The multi-sensory cubicle combines in a very small space the possibility of performing visual, auditory and tactile stimulation so that they can be combined in an individualized treatment room either for postural changes, for relaxation or for stimulation.

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Universidad de Alcalá

WALKER FOR THE MOBILITY OF PEOPLE WITH MOTOR DISABILITY

Patent
ES1104783 U

Code

BIO_UAH_12

Application areas

- Information and Communication Technologies
- Other Industrial Technologies
- Biological Sciences

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreementt

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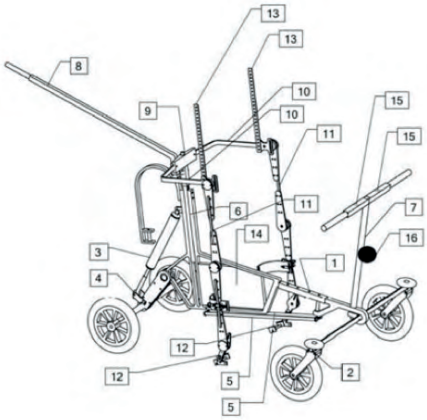

Figura 1

ABSTRACT

This walker includes a guide for the leg together with an electronic system that improves the user of manoeuvrability allowing the configuration of basic actions. Different machining processes and electronic development techniques are involved, supplementing its main functionality. The device of the invention consists of two different parts:

1) Wheeled structure providing stability
This structure has bars allowing the slippage of some elastics through them to facilitate reciprocal movement. This structure which provides the necessary stability has a support where the child is sitting. The walker can be adjusted to the child's height allowing to set different positions and to adapt to different user weights. The structure also carries a front bar where the child can support the hands and another one in the back allowing the adults take the child.

2) Harness with braces to support the child
Some braces are hanging from the harness allowing movements of feet, legs and hips. These articulated bars also support much of the children weight adapting the structure to their height in the growth stage.

ADVANTAGES AND INNOVATIONS

- It is not necessary to perform exaggerated movements in the feet, because the walker contains a design modification transmitting the lateral displacement almost immediately to its structure, as well as a development based on flat pieces.
- Production more economic obtained by the construction of wheeled structure with flat surfaces: the pieces are cut by a flexible cut mechanism such as waterjet or laser, therefore the most of the pieces are flat and they do not need subsequent machining.
- This structure has bars allowing the slippage of some elastics through them to facilitate reciprocal movement. These bars are joined to the child's ankles in the anteriorly part and others placed higher in the rear part to facilitate this movement.

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LOCATION SYSTEM AND NAVIGATION ASSISTANCE FOR BLIND PEOPLE, USING ARTIFICIAL VISION

Patent
ES2447641

Code

BIO_UAH_13

Application areas

- Information and Communication Technologies
- Biological Sciences

Type of Collaboration

- License agreement

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ABSTRACT

Navigational system for blind people sufficiently robust and simple to use that lets obtain an accurate location of the user in a known or unknown environment, both indoors and outdoors location. In this way the system will indicate the path that a person must follow to get to a destination, using acoustic information obtained by a voice synthesizer, similar to how the current GPS navigators do it. To this end, a method of locating and learning will be used, inspired in how human beings use visual capacity.
The location and environment mapping are two dependent processes that are calculated while the user navigates through it. The techniques are called SLAM (Simultaneous Localization and Mapping) and in recent years they have extended their application in the field of robotics and other emerging fields such as locating for blind people or surgery minimally invasive.
As a result of the great advances in research on object recognition using artificial vision, computers are able to recognize places such as monuments, or identify different objects in an image, such as faces or people, just by analyzing a single image. More and more, computers can develop similar tasks to the human vision.

ADVANTAGES AND INNOVATIONS

- It is the first system worldwide that presents the use of visual maps obtained by a stereo camera for navigation assistance to blind people, using visual information. It is an evolution of the SWAN Project (System for Wearable Audio Navigation) developed by the Georgia Institute of Technology, Atlanta, United States.
- In the near future the system is likely to be commercially exploited by institutions and companies in a variety of fields such as: assistance to the blind navigation, augmented reality, video games, humanoid robots, etc.
- The system has been successfully tested in the navigation assistance of humanoid robots and in a basic version with real blind people in the center of Madrid and Alcala de Henares.

Universidad de Alcalá

DEVICE AND METHOD FOR VENTRICULAR REPOLARIZATION ALTERNANS DETECTION BY WINDOWING

Patent
ES343054 B2

Code

BIO_UAH_15

Application areas

- Information and Communication Technologies
- Other Industrial Technologies
- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- License agreement
- Commercial agreement with technical assistance

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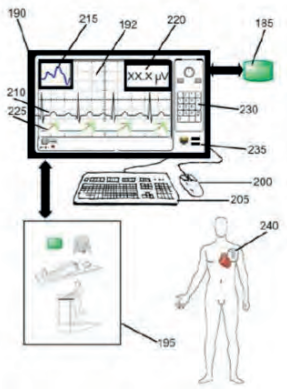

ABSTRACT

The designed scheme consists of the following:

1. Extraction and / or storage of the electrocardiogram (ECG)
2. Adaptation of the signal and elimination of noise and artifacts
3. Extraction of information of T-wave alternans (TWA) using the synthesis of a periodical window and the windowing of the signal
4. Post-processing for improving TWA detection
5. Detection of TWA from RAOT calculation and decision
6. Presentation of the results for estimating the TWA may be one or more of the following:
   - The Value of the power estimation, which may be in voltage units
   - Superposition of ventricular repolarization in order to visually identifying alternans
   - The estimated waveform of the alternating wave
7. Output Interface that transmits information to a user, to another processing stage or a device, about the existence or nonexistence of TWA in the signal.

ADVANTAGES AND INNOVATIONS

- The ECG is processed in the time domain.
- It is based on spectral analysis, using the ECG as an original signal sin the analysis.
- A small number of heart beats is used in the analysis, from 8 to 32.
- It is robust against noise, being valid for the analysis of any type of electrical signal of the heart from any existing device, like Holter monitoring long term, signals from exercise testing, cardiac monitoring devices or intracavitary signals from electrophysiological studies or implantable devices.

Using a reduced number of beats in the analysis:

- The variability effect of heart rate decreases.
- The resolution of the analysis improves.
- The computational cost is reduced, making it valid for implementation into any existing device, including portable or implantable devices.

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Universidad de Alcalá

NEW THERAPEUTIC AGENTS FOR THE TREATMENT OF INFLAMMATORY DISORDERS

TECHNOLOGY OFFER

Code

BIO_UAH_17

Application areas

- Biological Sciences

Type of collaboration

- Technical cooperation
- License agreement

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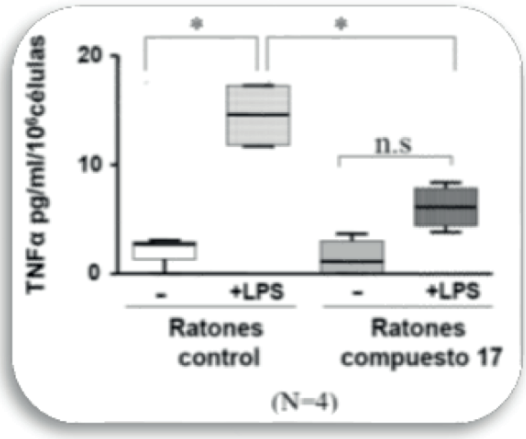

ABSTRACT

New inhibitors of TNF-α production are useful to prevent and/ or treat inflammatory diseases such as rheumatoid arthritis, osteoarthritis, Crohn disease, ulcerative colitis, asthma,bronchitis, chronic obstructive pulmonary disease, psoriasis, allergic rhinitis, ankylosing spondylitis, Hidradenitis suppurative, dermatitis and any other state with TNF-α high levels.

This compounds are capable to inhibit TNF- alpha expression at transcriptional level in primary human monocytes, what suggests that the mechanism could be related with some transcription factor and could regulate also the expression of additional citokinins. The effect seems to be apart independent from p38 MAPK or c-jun activation. The preliminary data suggest that NF-κB activity could be affected.

Besides TNF-α, these compounds also regulate the low production of of IL-1β y de IL-6 in THP-1 cells stimulated with LPS. The response to additional inflammatory stimulus has been explored such as poly I:C (ssRNA analogous) and the results show that this compounds also inhibit the TNF-α production and IL-12 response to stimulation with poly I:C in dendritic human cells differentiated in vitro.

Since metabolic diseases are related to low degree s inflammation, the action of those new inhibitors has been explored in mature human adipocytes produced in vitro from mesenchymal stem cells. The results show a lower regulation that depends on IL-6 production and leptin in human adipocytes stimulated with LPS.

In vivo studies in animal models, previous treated with low doses of this compounds, exhibit significantly lower TNF- alpha production when are subjected to powerful pro-inflammatory stimuli such us LPS. This result indicates that the compounds present anti-inflammatory effectivity when are administrated in vivo.

In relation to safety, long term treatment in mice with low doses of this compounds present absence of kidney, lung or liver toxicity.

ADVANTAGES AND INNOVATIONS

- Less secondary effects than steroidal anti- inflammatory drugs (hormones) and non steroidal anti- inflammatory drugs (NSAIDs) used nowadays.
- Oral administration.

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Universidad de Alcalá

DOUBLE PORT INJECTOR TO CORNEAL TRANSPLANT DMEK

Patent
ES2395681 B1

Code

BIO_UAH_18

Application areas

- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- License agreement

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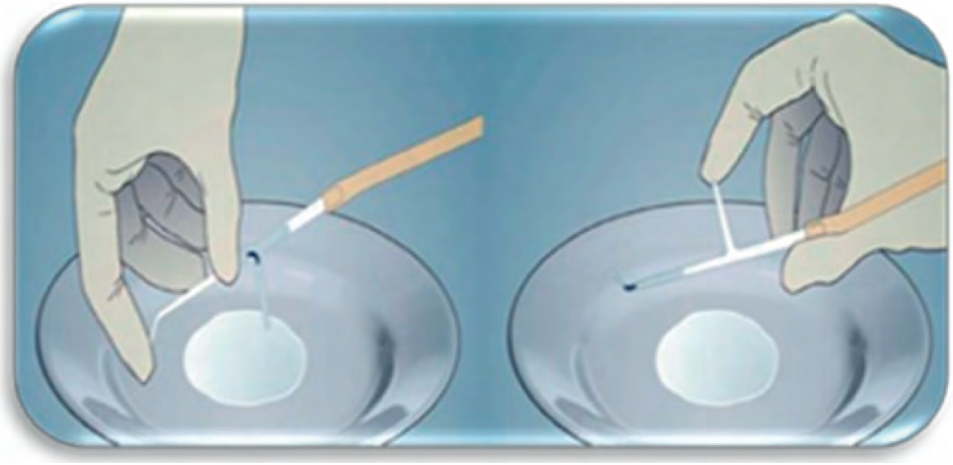

ABSTRACT

A Corneal Endothelium Inyector with two asymmetric and separate entrances ways. The entrance with a wider lumen is used to graft insertion without friction. The entrance with thinner lumen, located in the injector s tip, has been designed for the controled exit of the endotellium through a minimal incision.
This double port design allows to reduce the compression that affects the graft when it goes in through the port, unlike what it happens with injectors with one entrance, where the graft has to be compress to pass through the same track that uses to go out, increasing the friction.
The use of a closed system allows to vacuum the graft without touching it, besides with this invention it is unnecessary the use of viscoelastic agents that could interfere with the adhesion of the graft inside the eye.
All the process takes place continuously, there's no need to disable the injector from the aspiration/suction system, like happens with other injectors now in the market.
The injector is made in crystal to prevent adhesions and reduce the graft friction with the walls.

ADVANTAGES AND INNOVATIONS

- The main difference of this invention against other models nowadays in the market, is that it presents a double port with asymmetric lumen to separate the way of entrance and the way out. That will also reduce the graft compression when going through the injector. This is main difference with the one line injectors that share entry and exit.
- The injector is made in crystal to reduce adhesion and friction with the walls compared to plastic injectors.
- Both ports are separated and independent from de suction system, which makes the whole process take place continuously without need of disassemble the injectors from the aspiration system.

In conclusion, this new design try to diminish the endothelial damage during corneal endothelial graft implantation in eye s anterior chamber.

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METAL NANOPARTICLES STABILIZED WITH CARBOSILANE DENDRONS FOR THE TREATMENT OF INFECTIOUS DISEASES AND CANCER

Patent
ES2609464

Code

BIO_UAH_19

Application areas

- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- Comercial agreement
- License agreement

Main Researcher

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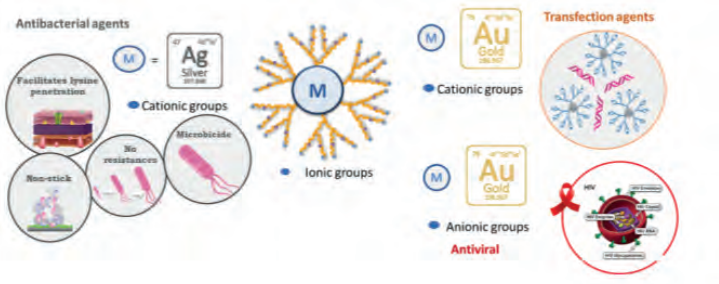

ABSTRACT

The present invention provides metal nanoparticles coated with dendrons of carbosilane structure which are functionalized at their periphery with anionic groups (such as carboxylate, sulfonate or sulfate), that give the macromolecule a negative net charge, or cationic (ammonium) that give the dendrimer a positive net charge. Preferably, the nanoparticles are made of gold and silver and the carbosilane dendrons have been functionalized by thiolene addition.

The process of obtaining the NPs of the invention allows, by a simple process, the synthesis of cationic or anionic systems, and also the possibility of synthesizing heterofunctionalized NPs, that consists in introducing also some dendron with one or more of its branches substituted by different groups, such as chromophore groups.

Useful in biomedicine, specifically in the treatment of infectious diseases or cancer. These include the use of cationic derivatives as non-viral transport agents for the transfection or internalization of nucleic material within different cell lines in gene therapy processes or also the use of these cationic or anionic compounds as therapeutic agents, for example, as antibacterial, antiviral or antiprionic agents.

Cationic compounds are used as antimicrobial agents. Thus, they can be used for the prevention and / or treatment of bacterial infections. It can be used for the prevention and / or treatment of diseases of viral origin, such as AIDS, Herpes, Influenza or others.

ADVANTAGES AND INNOVATIONS

In the state of the art there are metallic nanoparticle applications and dendritic systems in biomedicine, but there are very few examples of dendronized nanoparticles, that combine the properties of these two types of compounds, metal nanoparticles and dendrimers.

This invention provides a first example of dendronization of metal nanoparticles with ionic carbosilane dendritic systems and the obtained results show improvements over the use of the individual components separately.

Metal nanoparticles (NP) can be heterofunctional, with the advantage of being able to perform more than one function simultaneously. Thus, for example, the anionic NPs more than having only antiviral capacity because of their negative charge, they may be marked to facilitate their monitoring or may also have target groups that direct the dendrimers specifically to their place of action.

Likewise, heterofunctional cationic NPs may simultaneously have, for example, positive charges for the transport of nucleic acids or anionic drugs and targeting groups such as an antibody to direct these dendrimers to a specific site, or also fluorophores or other drugs.

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CARBOSILANE DENDRIMERS WITH POLYPHENOLIC GROUPS. USES AS ANTIOXIDANTS AND ANTICANCER

Patent
ES2651114

Code

BIO_UAH_20

Application areas

- Biological Sciences
- Agrofood Industry
- Pharmaceutical and Cosmetics

Type of Collaboration

- Technical cooperation
- Comercial agreement
- License agreement

Main Researcher

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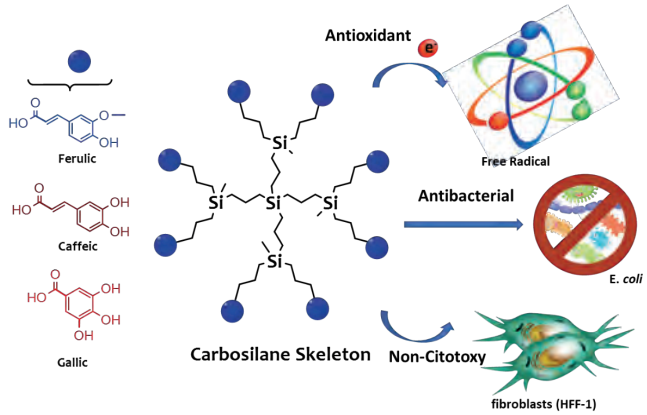

ABSTRACT

The present invention provides metal nanoparticles coated with dendrons of carbosilane structure which are functionalized at their periphery with anionic groups (such as carboxylate, sulfonate or sulfate), that give the macromolecule a negative net charge, or cationic (ammonium) that give the dendrimer a positive net charge. Preferably, the nanoparticles are made of gold and silver and the carbosilane dendrons have been functionalized by thiolene addition.

The process of obtaining the NPs of the invention allows, by a simple process, the synthesis of cationic or anionic systems, and also the possibility of synthesizing heterofunctionalized NPs, that consists in introducing also some dendron with one or more of its branches substituted by different groups, such as chromophore groups.

Useful in biomedicine, specifically in the treatment of infectious diseases or cancer. These include the use of cationic derivatives as non-viral transport agents for the transfection or internalization of nucleic material within different cell lines in gene therapy processes or also the use of these cationic or anionic compounds as therapeutic agents, for example, as antibacterial, antiviral or antiprionic agents.

Cationic compounds are used as antimicrobial agents. Thus, they can be used for the prevention and/or treatment of bacterial infections. It can be used for the prevention and/or treatment of diseases of viral origin, such as AIDS, Herpes, Influenza or others.

ADVANTAGES AND INNOVATIONS

- The dendritic nature gives these derivatives a nanoscopic size and a multivalence (capacity to accommodate multiple groups on its surface) that can favor the properties of these compounds.
- The carbosilane nature of these derivatives gives them a hydrophobic character which can help them to interact with biological membranes, enhancing their activity. By having polyphenolic groups (GPF) in their structure, they are able to give characteris- tic properties to the dendritic molecule by functionalizing its surface, in such a way that they can act as powerful antioxidants and free radical scavengers.
- The compounds of the invention may be used alone or in combination with one or more compounds of the invention, or in combination with one or more different drugs (or any combination thereof).
- Greater stability against degradation and
  Ease of diffusion through biological barriers, and therefore access to target cells.

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Universidad de Alcalá

CARBOSILANE DENDRIMERS WITH POLYPHENOLIC GROUPS. USES AS ANTIOXIDANTS AND ANTICANCER

Patent
ES2543640

Code

BIO_UAH_21

Application areas

- Biological Sciences
- Agrofood Industry
- Pharmaceutical and Cosmetics

Type of Collaboration

- Technical cooperation
- Comercial agreement
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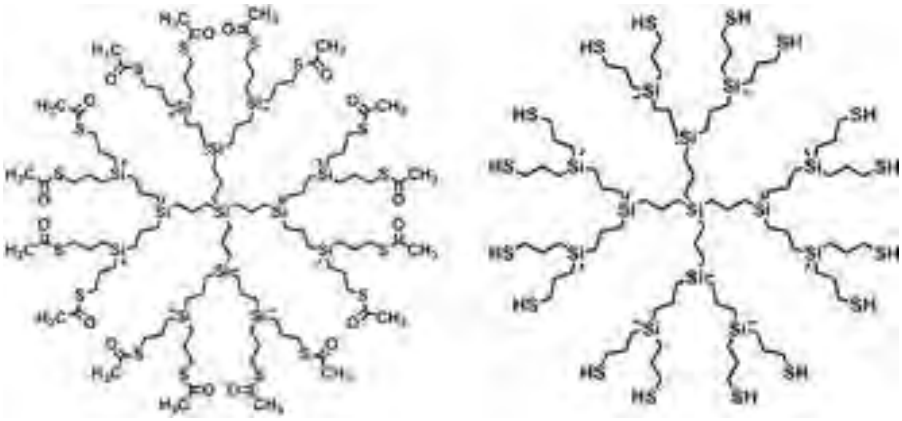

ABSTRACT

The present invention gives rise to highly branched dendritic macromolecules synthesized from a polyfunctional nucleus, called dendrimers, of carbosilane structure, that is, they contain in their structure silicon-carbon bonds and functionalized in their periphery with thiol groups. In addition, the invention provides a process for obtaining them and their uses as antioxidants.

The dendrimers of the invention can have application in different fields such as cosmetics, among which its use as antioxidants is worth mentioning since they can protect products that are particularly sensitive to oxidation. For example, in hair care compositions such as shampoos, lotions, gels, emulsions or hairsprays, which can be applied before or after different hair treatments, such as dyeing, wicks, hair discoloration, as well as permanent or smoothed among others.

They can also be used as antioxidants in skin care products or makeup products, in mascara for lashes and eyebrows, anti-aging creams, lengthening the durability of lipsticks, eye shadows, blushers, eyeliners or nail polish. Also in the care of the skin as constituents of lotions, creams and milk cleansing.

ADVANTAGES AND INNOVATIONS

- Respond predictably in solution
- They can be extensively modified to carry multiple ligands with biological activity
- They can cross biological barriers
- Dendrimers are multivalent systems that allow the incorporation of multiple functionalities-SH on the surface of a single molecule increasing the concentration of active centers per molecule and therefore enhancing the antioxidant capacity of the system
- In addition, they can be used as anchoring platforms for different molecules through click chemistry processes such as the addition of thiolene
- The commercial thiol derivatives used in cosmetics have the inconvenient of the characteristic bad smell of the compounds with sulfur, while in the dendrimers referred to in this invention, that odor is much less intense, being more pleasant its use

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Universidad de Alcalá

METHOD OF DIAGNOSIS OF NON-INVASIVE RENAL FAILURE AND PRIOR TO SYMPTOMS AND FUNCTIONAL DISORDERS

TECHNOLOGY OFFER

Code

BIO_UAH_22

Application areas

- Life Sciences, Medicine, Pharma

Type of collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

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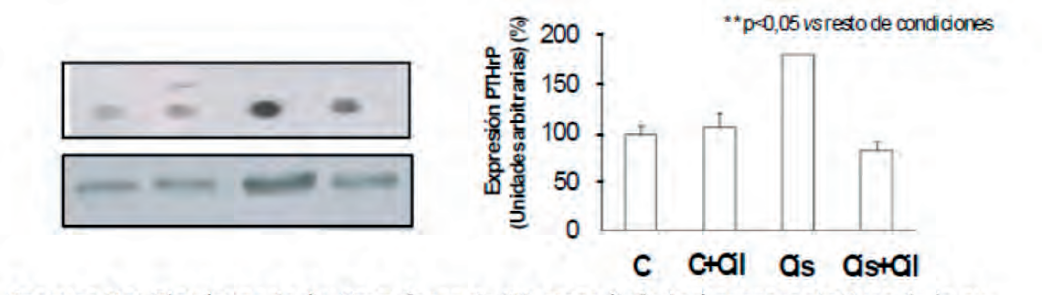

ABSTRACT

Renal disease can be acute or chronic and both progress with Renal Insufficiency (RI) and ultimately death.

In recent years the search and identification of new RI biomarkers molecules, particularly in urine, has intensified.

The invention describes the diagnosis of acute or chronic Renal Insufficiency by urinary quantification of the protein related to Parathyroid Hormone PTHrP, comparing that amount with at least one reference value and diagnosing RI based on that comparison. PTHrP is normally undetectable in organic fluids of a healthy individual, so that its mere presence already serves as a marker of disease. Thus, the finding of an increased urinary PTHrP value in comparison to the value found in healthy individuals results in a biomarker indicative of acute or chronic IR.

The most viable method is to analyze urine samples using Western Blotting of proteins using a specific monoclonal antibody that recognizes the protein related to Parathormone (PTHrP). The presence of a single band, in addition to demonstrating the specificity of the methodology used, allows to use a simpler detection technique such as the dot blot.

In order to quantify the above analysis, a preferred embodiment of the method of the invention is that the reference value is obtained from a control sample. And that the individual from which the urine sample is taken is a mammal, preferably a human.

ADVANTAGES AND INNOVATIONS

The biomarker described has the following major clinical advantages over other known biomarkers:

- The method only requires the analysis of an isolated sample of urine to make possible the diagnosis of RI.
- While the diagnostic utility of known biomarkers in urine is limited to acute renal failure (ARF), this method further allows the diagnosis of chronic renal failure (CRF).
- Since the method described in this invention only requires the analysis of an isolated urine sample, it makes it possible to diagnose acute or chronic RI in isolated samples from patients' urine or in single samples, and even in old urine samples allowing the retrospective diagnosis even in the absence of serum or plasma.
- The presence of a unique band, in addition to demonstrating the specificity of the methodology used, allows the use of a simpler detection technique such as the dot blot.

Universidad de Alcalá

NEW INHIBITOR COMPOUNDS OF THE TYROSINE PHOSPHATASE 1B PROTEIN

Patent
ES2522717 B1

Code

BIO_UAH_23

Application areas

- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- License agreement
- Commercial agreement with technical assistance

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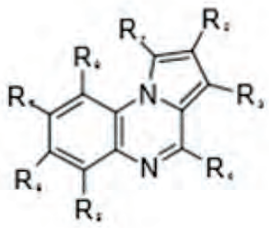
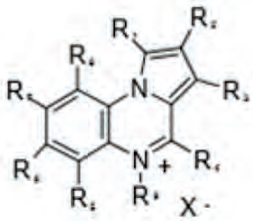


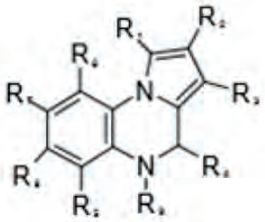
I

Fig. 1



II

Fig. 2



III

Fig. 3

Figure 1, 2 and 3.- View of the structure of new compounds of Formula I, Formula II and Formula III

ABSTRACT

The invention describes the presentation of three families of compounds with inhibitory activity on protein tyrosine phosphatase B1 (PTP1B). The new compounds of this invention have a structure of pyrroloquinoxaline and pyrroloquinoxalinium, never before used in the inhibition of PTP1B.
The present invention is related to the field of chemical synthesis of new compounds and their use as inhibitors of PTP1B, which are useful in the treatment or prevention of diseases in which PTP1B is known to be involved in the pathogenesis
As inhibitors of phosphatase activity and, in particular, as inhibitors of PTP1B, the novel compounds of the present invention can be used for the treatment of insulin resistance, glucose intolerance, obesity, diabetes mellitus, hypertension and ischemic diseases of large and small blood vessels, conditions that accompany type 2 diabetes including dyslipidemia, for example, hyperlipidemia and hypertriglyceridemia, atherosclerosis, vascular restenosis, irritable bowel syndrome, pancreatitis, adipose cell cancer and carcinomas such as liposarcoma, and other disorders where insulin resistance is indicated. In addition, the compounds of the present invention can be used for the treatment of cancer, osteoporosis, neurodegenerative and infectious diseases, and diseases involved with inflammation and the immune system.

ADVANTAGES AND INNOVATIONS

The formulas described in the invention represent a novelty in terms of the inhibition of PTP1B, since they are sufficiently lipophilic allosteric inhibitors, that represents an advantage over the active center inhibitors discovered before, which show a very low bioavailability and which failed in clinical trials.

It presents commercial potential at an international level, focused mainly on the markets of the US, Europe, Australia, Japan and India with reasonable difficulty and cost of implementation.

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Universidad de Alcalá

CARBOSILANE DENDRIMERS AND THEIR USE AS ANTIVIRALS

Patent
ES 2364264 B2

Code

BIO_UAH_24

Application areas

- Biological Sciences, Biotechnology, Medicine, Health Science

Type of Collaboration

- Technical cooperation
- License agreement
- Manufacturing agreement
- Commercial agreement with technical assistance

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ABSTRACT

Dendrimers are hyperbranched molecules of well-defined three-dimensional size and structure and possessing uniform chemical properties due in part to their low polydispersity. The nature and properties of the dendrimers can be controlled by acting on the core of the dendrimer, on the growth units or branches or on the periphery of dendrimers.

The dendrimers of this invention are of carbosilane and the surface is covered with different anionic groups, which give dendrimers antiviral properties.
The ability of dendrimers to interfere with the virus-cell interaction suggests that they could act as topical microbicides, that is, compounds applied to the vaginal or rectal mucous to prevent sexually transmitted diseases. Therefore, another aspect of the present invention relates to dendrimers as a medicine per se. This medicine being preferably for the prevention and / or treatment of diseases caused by viruses, bacteria or fungi. And more preferably when the disease is caused by strains of HIV.

As antivirals, these dendrimers prevent the correct process of virus adhesion to the target cell, as well as the infection and its corresponding production of new viral particles.

ADVANTAGES AND INNOVATIONS

The anti-inflammatory properties of these dendrimers are additional advantages with respect to other dendrimers with antiviral, antibacterial or antipyretic activity.

In addition to the prophylactic application, they have therapeutic effect especially in sexually transmitted diseases, by preventing the infection of cells not yet infected.
Their preparation as pharmaceutical formula can be very varied, being possible any solid composition (tablets, pills, capsules, granules, etc.) or liquid (gels, solutions, suspensions or emulsions). For oral, nasal, topical or parenteral administration, preferably the administration will be topical.

These dendrimers by themselves have biological activity as antiviral agents. They have in vitro activity against a variety of viruses.

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Universidad de Alcalá

CARBOSILANE DENDRIMERS WITH A POLYPHENOLIC NUCLEUS AND THEIR USE AS ANTIVIRALS

Patent
ES 2364264 B2

Code

BIO_UAH_25

Application areas

- Biological Sciences, Biotechnology, Medicine, Health Science

Type of Collaboration

- Technical cooperation
- License agreement
- Manufacturing agreement
- Commercial agreement with technical assistance

Main Researchers

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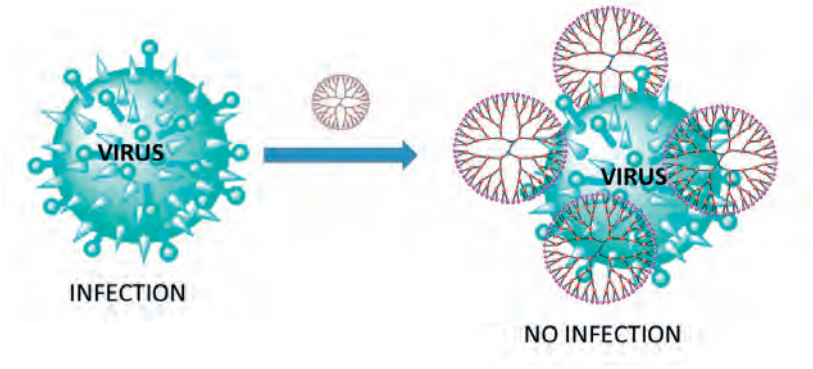

ABSTRACT

Dendrimers are hyperbranched molecules of well-defined threedimensional size and structure and possessing uniform chemical properties due in part to their low polydispersity. The nature and properties of the dendrimers can be controlled by acting on the core of the dendrimer, on the growth units or branches or on the periphery of dendrimers.

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These dendrimers by themselves have biological activity as antiviral agents. They have in vitro activity against a variety of viruses.

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DERIVATIVES OF INDOLIN-2-ONE AND ITS THERAPEUTIC USE IN INFLAMMATORY, AUTOIMMUNE, METABOLIC, CARDIOVASCULAR, NEUROLOGICAL AND CANCER DISEASES

Patent
ES2646993

Code

BIO_UAH_26

Application areas

- Biological Sciences, Health Science

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

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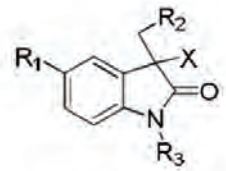
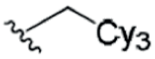


(I)

View of the structure of the compound of Formula I

ABSTRACT

A compound whose base formula (I) is in the image, where O represents a pharmaceutically acceptable salt thereof, wherein X represents hydrogen or halogen; R1 represents hydrogen or halogen; R2 represents phenyl or Cy1 and R3 represents hydrogen or a group of formula:



The compounds of formula (I) and their salts may differ in certain physical properties, but are equivalent for purposes of the invention.
Other aspects of the invention are related to (1) pharmaceutical composition comprising a compound of formula (I) as defined above and one or more pharmaceutically acceptable excipients thereof and (2) use of a compound of formula (I) for the manufacture of a medicament for the treatment of a disease associated with the modulation of the AMPK enzyme, such as autoimmune, inflammatory, cardiovascular, metabolic, neurological and cancer diseases, more preferably where the disease is selected from diabetes type 1 and 2, obesity, inflammation, dyslipidemia, hypertension, hyperglycemia, hypertriglyceridemia, insulin resistance, epilepsy, stroke, Krabbe / Twitcher diseases, Alzheimer's, Parkinson's, Huntington's and cancer, even more preferably where the disease is cancer; and still more preferably where the disease is prostate cancer, breast cancer, pancreatic cancer, uterine cancer and gliomas.
The compounds of formula (I) can exist in different physical forms, for instance, in amorphous form and crystalline forms.
As for the administration of the compounds, this can occur in several formulations: oral, parenteral, nasal, ocular, rectal, and topical.

ADVANTAGES AND INNOVATIONS

- The formulas described in the invention represent a novelty in terms of the modulation of the levels of AMP/ATP optimal concentrations, using derivatives of indolin-2-one, which act as modulators of AMPK, whose decompensation is related to the appearance of metabolic diseases, cancer, etc., which represents an advantage with respect to the products currently in the market.
- The administration of the compounds can be done in several formulations: oral, parenteral, nasal, ocular, rectal, and topical, which significantly improves their use.
- It presents commercial potential at a national and international level, with reasonable difficulty and implementation cost.

Last updated 06/2020

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CARBOSILANE DENDRONS FUNCTIONALIZED WITH FATTY ACIDS: FORMATION OF MICELLES AND USES IN BIOMEDICINE AS ANTIVIRAL, ANTIBACTERIAL, ANTIPRIONIC, ANTIMICROBIAL AND DRUG TRANSPORTERS

Patent
ES2657282 B1

Code

BIO_UAH_27

Application areas

- Biological Sciences, Health and Pharma
- Environment and risk prevention

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

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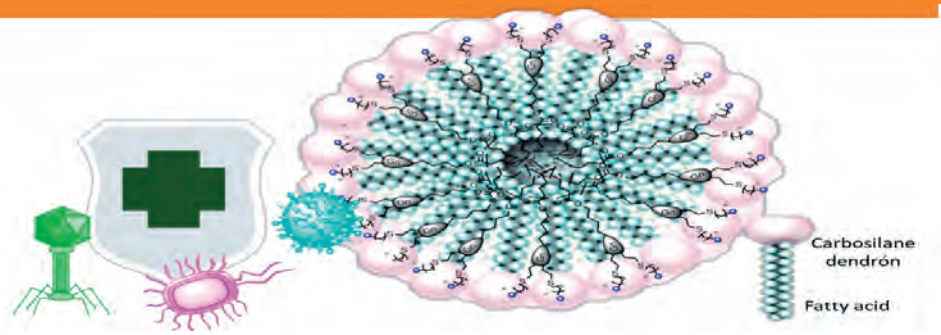

ABSTRACT

The present invention provides compounds formed by dendrons of carbosilane structure that are functionalized in their periphery with anionic groups (such as carboxylate, sulfonate or sulfate), which endow the system with a net negative charge, or cationic (such as ammonium), which endow the system with a positive net charge.

These dendrons present a focal point that contains a hydrophobic function, mainly derived from a fatty acid. The fatty acid is linked to the dendron preferably through an ester bond, without dismissing other bonds, or even through electrostatic interactions.

The patent also includes the preparation of Janus type dendrimers, which are characterized by being formed by two dendritic units that have some distinct structural feature.

And finally, the invention includes the ability of the described compounds to form micelles. The principal medium for its formation would be aqueous but micelles can also be formed in solutions containing soluble salts in these media or surfactants.

Regarding the uses in biomedicine of these compounds and the micelles formed by them, it is worth highlighting: their use as non-viral transport agents for the transfection or internalization of nucleic material within different cell lines in gene therapy processes; use of these compounds as "per se" therapeutic agents, e. g. as antiviral, antimicrobial or antipyretic agents, or as drug transporters, even for the preparation of a drug of solid or liquid composition and oral, nasal, topical or parenteral administration.

In their environmental application, they can be used as biocides to prevent the appearance of microorganisms on surfaces or water treatment.

ADVANTAGES AND INNOVATIONS

- These systems are able to overcome some of the difficulties that certain drugs found, increasing their solubility and even acting as transporters to the areas of interest.
- Ease of diffusion of dendrimers through biological barriers, and therefore access to target cells.
- Possibility of encapsulation and transport of drugs or other molecules with biological activity.
- The preparation of these dendrimers as pharmaceutical formula can be very varied, being possible any solid composition (tablets, pills, capsules, granules, etc.) or liquid (gels, solutions, suspensions or emulsions). For oral, nasal, topical or parenteral administration.

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Universidad de Alcalá

NANOCONJUGATES FORMED BY DENDRITIC MOLECULES AND PEPTIDES AS ANTITUMOR AGENTS AGAINST ADVANCED PROSTATE CANCER

Patent
ES2677242 A1

Code

BIO_UAH_28

Application areas

- Biological Sciences, Health and Pharman

Type of Collaboration

- Technical cooperation
- License agreement
- Commercial agreement with technical assistance

Main Researchers

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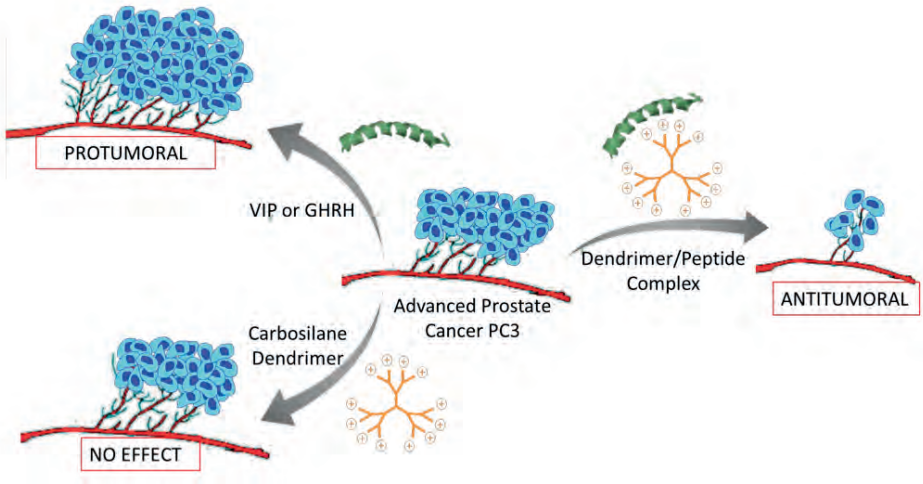

ABSTRACT

The treatment of advanced prostate cancer is nowadays only palliative. In this stage, it is androgen-independent and, unfortunately, is even favored by several human neuropeptides, as vasoactive intestinal peptide (VIP) and growth hormone-releasing hormone (GHRH). The present invention provides the preparation of active nanoconjugates against advanced prostate cancer and to prevent metastasis.

These systems are formed by dendritic molecules and neuropeptides. Preferably, the dendritic macromolecules are of carbosilane structure, mainly with cationic functions in the periphery, and the neuropeptides are of the glucagon / secretin family, mainly VIP, GHRH and PACAP.

The present invention also relates to the biomedical uses of the peptide/dendritic molecule combinations, preferably for the development of drugs for the treatment of advance prostate cancer. However, other types of cancers are not excluded.

ADVANTAGES AND INNOVATIONS

- The properties of nanoconjugates allow treating tumor cells of advance prostate cancer.
- Dendritic systems can be used as transporters of drugs or antitumor nucleic acids due to their ability to be absorbed "in vivo" in tumor zones and to internalize the treatment in cancer cells.
- The dendrimer also remains in the tumor zone without returning to the bloodstream.
- The necessary development, for the commercial exploitation of this patent, does not entail a high technical difficulty.

Last updated 06/2020

Universidad de Alcalá

COMPOUNDS FOR THE TREATMENT OF LEISHMANIA INFECTIONS

Patent
ES2526935 B2

Code

BIO_UAH_30

Application areas

- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- License agreement
- Commercial agreement with technical assistance

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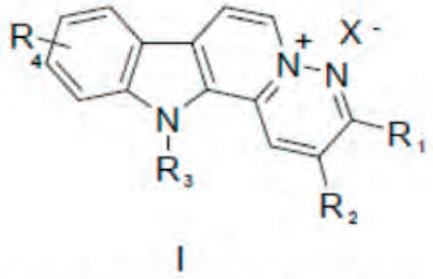

I

Estructura de nuevos compuestos de Fórmula I

ABSTRACT

Preparation and uses of a series of compounds that act as bioactive agents against the Leishmania parasite and as therapeutic agents in the treatment of this disease, in both, its visceral (LV) version and in the mucocutaneous one (CML).
The preparation and use of the structures of pyridazino [1 ', 6': 1,2] pyrido [3,4-b] indolinium salts presented can be an interesting solution for the treatment of the disease, the infections caused by the parasite and to inhibit the growth of this one.
The present invention relates to a pharmaceutical composition comprising at least one of the compounds of the invention, together with a pharmaceutically acceptable vehicle.
The pharmaceutically acceptable adjuvants and vehicles that can be used in said compositions are the adjuvants and vehicles known to those skilled in the art and commonly used in the preparation of therapeutic compositions.

ADVANTAGES AND INNOVATIONS

- The compounds of the invention produce less toxicity and fewer side effects in the patient.
- The compounds of the invention are pharmaceutically acceptable salts, prodrugs and/or solvates, as well as pharmaceutical compositions containing them. They can be used together with other drugs, or additional active ingredients, to provide a combination therapy.
- This new result has good specificity for the Leishmania parasite and would be a competitive advantage for that pharmaceutical company that would manufacture an active ingredient for the formulation of a leishmanicidal drug.
- Given the similarity of the different species of Leishmania, the compounds of the invention are used for the treatment of any type of leishmaniasis. Both visceral (LV) and mucocutaneous (LMC).
- The therapeutic composition can be prepared in solid form or aqueous suspension, in a pharmaceutically acceptable diluent.
- It can be administered by any appropriate route of administration: oral, topical, rectal or parenteral.

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Universidad de Alcalá

CARBOSILANE METALLODENDRIMERS CONTAINING RUTHENIUM AND COPPER IONS COORDINATED TO SCHIFF BASE LIGANDS, THEIR PREPARATION AND USES

Patent
ES2735282

Code

BIO_UAH_32

Application areas

- Biological Sciences
- Agrofood Industry
- Pharmaceutical and Cosmetics

Type of Collaboration

- Technical cooperation
- Comercial agreement
- License agreement
- Manufacturing agreement

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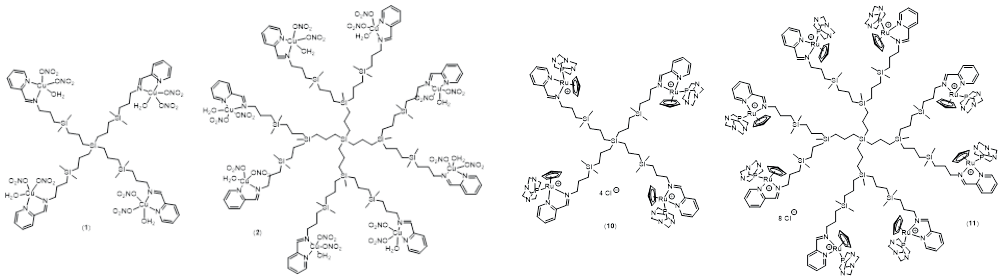

ABSTRACT

Preparation of metallodendrimers for their use in the treatment of various cancers, especially advanced prostate cancer, as well as infectious diseases caused by bacteria and other biomedical applications.

These systems are based on carbosilane dendritic skeletons functionalized on their periphery with Schiff bases capable of coordinating metal atoms, in this specific case the metals coordinated to the dendritic system are Cu(II) and Ru(II).

The preparation is carried out by coordinating the corresponding metal salt to the Schiff base groups of the precursor dendrimers, through simple synthetic routes with high yields.

In the metallodendrimers of the present invention, the dendrimer significantly increases the therapeutic activity with respect to the isolated metal complexes. Its antitumor activity in a variety of cell lines (derived from breast, cervix, prostate and colon tumours) is in the micromolar range and is selective, up to 16 times more active in tumour cell lines than in healthy ones. This antitumour activity is reproducible in in vivo assays, reducing up to 36% the volume of the subcutaneous tumour in immunosuppressed mice. In addition, they show bacteriostatic and bactericidal activity in both Gram+ and Gram- type bacteria. Therefore, these compounds are an interesting alternative for the use in the pharmaceutical industry, and can be employed as new drugs or formulations containing them, for the treatment of tumour diseases and as antimicrobial drugs.

ADVANTAGES AND INNOVATIONS

- Due to the lipophilic nature of the skeleton, even small generation systems have a high interaction with biological membranes, resulting in high biological activity and synthetic cost savings.
- The preparation process is highly versatile and can easily generate metallodendrimers based on different metals and on demand depending on the application.
- The dendritic nature gives these derivatives a nanoscopic size and a multivalence (capacity to host multiple groups on its surface) that can favour the properties of these compounds and different from what it would be found in these same groups if they were individually.
- Biodistribution tests carried out by ICP, after several in vivo assays, show that they are eliminated by urine and faeces, presenting low cardiotoxicity and low-moderate liver damage.
- The necessary development, for the commercial exploitation of this patent, does not involve a high technical difficulty

Last updated 06/2020

MAGNETIC NANOPARTICLES STABILIZED WITH CARBOSILANE DENDRITIC SYSTEMS AND THEIR USES

Patent
ES2735282

Code

BIO_UAH_33

Application areas

- Biological Sciences
- Agrofood Industry
- Pharmaceutical and Cosmetics

Type of Collaboration

- Technical cooperation
- Comercial agreement
- License agreement
- Manufacturing agreement

Main Researchers

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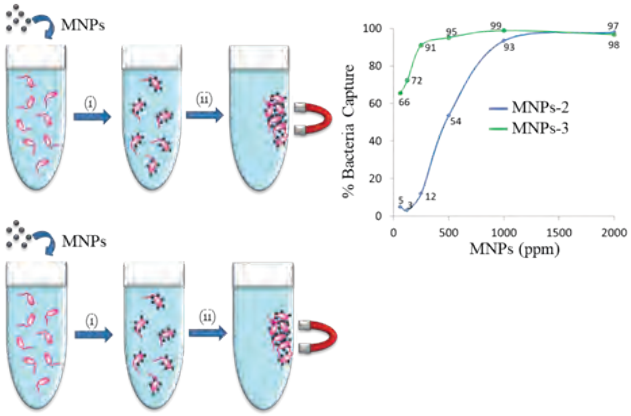

ABSTRACT

Procedure for obtaining and using of magnetic nanoparticles stabilized with cationic carbosilane dendritic systems. These nanoparticles interact with microorganism and nucleic acids for their removal or extraction.

The present invention develops magnetic nanoparticles (MNPs) than contain on the surface cationic carbosilane dendritic molecules. These molecules are multifunctional and allow increasing the number of functions on the NPs surface. Moreover, due to their structure, these groups are available for interaction with the environment, since are located apart from the NP surface.

The cationic groups of dendritic MNPs interact with microorganisms as bacteria, which cell wall present negative domains, and with phosphate groups of nucleic acid chains (DNA, RNA, etc.). On the other hand, the magnetic properties of the MNPs favour their use due to the fact that the application of an external magnetic field removes the NPs from any suspension.

The combination of the above characteristics have been exploited to remove bacteria and nucleic acids from aqueous suspensions, by mixing the suspension containing bacteria or nucleic acids with the MNPs and then applying a magnetic field (even with a simple neodymium magnet).

These MNPs covered with dendritic carbosilane molecules are useful for water purification, microorganism or nucleic acid detection or for their removal.

ADVANTAGES AND INNOVATIONS

- Respond predictably in solution
- Interact with bacteria cell walls
- Interact with nucleic acids
- Dendrimers are multivalent systems that allow the incorporation of multiple functionalities on the nanoparticles surface
- The cationic charge favours the interaction with bacteria membranes and nucleic acids
- The magnetic properties of the nanoparticles allow their extraction from any suspension

Last updated 06/2020

Universidad de Alcalá

DRUG FORMULATION AND BIODISPONIBILITY

TECHNOLOGY OFFER

Code

BIO_UAH_34

Application areas

- Biological Sciences
- Other indistrial technologies

Type of collaboration

- Manufacturing agreement
- Comercial agreement
- Service agreement

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ABSTRACT

This consolidated research group frames its research activity in the design, development, elaboration, control and evaluation of immediate or modified-release drugs, which has allowed new galenic developments and an optimization of existing drug formulations, or betting for galenic innovations.
The group has worked on numerous projects and maintains regular collaborations with companies in the pharmaceutical sector, which allows it to focus its research in a practical way and bring the results obtained closer to the market.
Our main lines of research focus on expanding the knowledge of the properties of drugs in relation to their polarity that allow us to find solutions to problems of solubility in liquid formulations, development of models and predictive theories of solubility, promotion of vectorization strategies to increase bioavailability, advance in the characterization of the drug release and/or absorption processes from the medicine that contains them and the evaluation of the pharmacokinetic profile after its administration to the organism, advance in the physical-chemical-drug-excipient characterization, development of rational criteria beneficial in drug formulation by predicting the release of active ingredients from polymer matrices, providing criteria that facilitate the prediction of drug release based on physical- chemical characteristics, polarity and degree of interaction with the polymer, saving in this way time and effort in the design of release systems.

ADVANTAGES AND INNOVATIONS

- Technical advice and consulting on drug formulation and development, scaling and manufacturing of pilot batches, quality control, stability studies, and manufacturing to third parties.
- Preformulation studies.
- Galenic design and development of innovative, generic and brand name (OTC) drugs.
- Galenic design and development of new forms of administration.
- Compatibility studies of active ingredients and excipients.
- Design of manufacturing processes.
- Expert reports.
- Patent study.

Last updated 06/2020

Construction and infrastructure

- Lime-cement mixture with improved thermal and acoustic characteristics
- Ventilated facade building systerm of folded sheet without frame
- Vibroacoustic spectometry system for the non-destructive analysis of materials.

Universidad de Alcalá

LIME-CEMENT MIXTURE WITH IMPROVED THERMAL AND ACOUSTIC CHARACTERISTICS

Patent
ES-2548221

Code

CONSTR_UAH_03

Application areas

- Industrial Manufacture, Material and Transport technologies
- Other Industrial Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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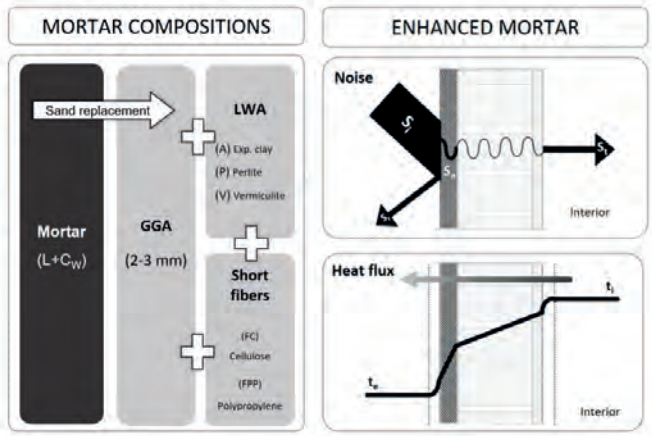

ABSTRACT

The present invention is a modified mixture of lime and cement with improved termal and acoustic characteristics. The new mixture can be used on interior and exterior walls, in new construction and rehabilitation or in built heritage restoration. The mixture is characterized by de following components: a hydraulic binder, an aerial binder, a gap-graded siliceous or calcareous aggregate, lightweight aggregates with a maximum size of 4 mm (expanded perlite, expanded shale, expanded clay or a mixture thereof), short fibres of cellulose or polypropylene and/or mineral pigments.
In the scope of the present invention, is preferable to use a mixture of White cement and aerial lime as binder that accelerates lime setting time. It allows adapting to aesthetic requirements, because of being pigmentable with the use of metal oxides.
The group seeks manufacturers of building materials and construction companies specialized in rehabilitation to reach licensing agreements, collaboration and commercial agreements with technical assistance.

ADVANTAGES AND INNOVATIONS

- The compositions of the mixture improve thermal and acoustic aspects compared with conventional mixed mortar.
- The mechanical strength provided by the compositions of the mixture is enough to be used as a finishing material on an external wall.
- No need to be protected with a better mechanical and durability performance finishing on the face where you have applied the mixture.
- The sound absorption coefficient of mortars improves.
- Improvement in the compound's thermal capacities.
- Applicable on interior and exterior walls, in new construction and rehabilitation or restoration of built heritage.

Last updated 06/2020

Universidad de Alcalá

VENTILATED FACADE BUILDING SYSTEM OF FOLDED SHEET WITHOUT FRAME

Patent
ES2664768

Code

CONSTR_UAH_05

Application areas

- Industrial Manufacture, Material and Transport technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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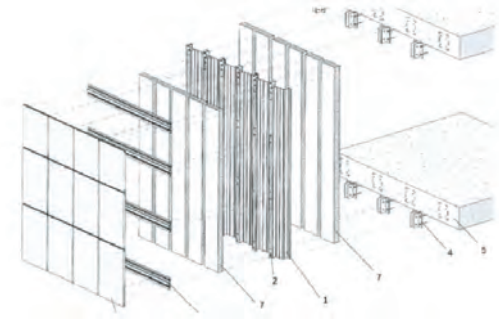

ABSTRACT

New ventilated facade system characterized by the incorporation of a folded sheet placed in the middle of the section, which acts as a structural element of the façade and holds the rest of the materials and constituents of the facade. The sheet is folded forming ribs on both sides of the sheet, strengthening the façade and producing suitable modulations for both fixing the outer finishing material and transmitting the loads (own weight and horizontal actions) to the structure of the building by means of fastening elements located in the edge of the floor slab.

With this ventilated facade system the overall mechanical stiffness of the façade is improved as a result of the inclusion of the folded sheet, increasing the mechanical resistance of the assembly against horizontal actions, especially those produced by extreme climate events, such as strong winds, earthquakes or other, increasing the postevent resilience of the facade.

The group looks for companies in the building sector and manufacturers of facade systems to sign technical cooperation agreements, commercial agreements with technical assistance and patent licensing agreements.

ADVANTAGES AND INNOVATIONS

The invention does not require a structural frame, since the folded sheet forming ribs on both sides of the sheet endows the facade with mechanical stiffness giving the system the ability to transfer mechanical loads without the need of a specific structure.

Regarding the construction procedure of the facade, it facilitates the redesign of the facade regarding the structure of the building, since it allows the adjustment at the fixing points both in height and in the direction perpendicular to the facade by means of mechanical joints arranged in the side of the rib. The fixing system only requires adjusters in the horizontal direction contained in the facade plane, rather than the threedimensional adjusting systems required in conventional frame ventilated facades.

- Technical difficulty and reasonable implementation costs.
- The other facade elements can be fixed directly to the folded sheet.
- It allows to establish a modulation to the interior equal or different from the one of the exterior.
- Improves the overall performance of the facade and increases resilience during and after an extreme event linked to the effect of water or external horizontal forces, such as those produced by strong winds, hurricanes, earthquakes, etc.

Last updated 06/2020

Universidad de Alcalá

VIBROACOUSTIC SPECTROMETRY SYSTEM FOR THE NON-DESTRUCTIVE ANALYSIS OF MATERIALS

Patent
ES2597979 R1
&
ES2597979 B2

Code

CONSTR_UAH_06

Application areas

- Industrial Manufacture, Material and Transport technologies
- Other Industrial Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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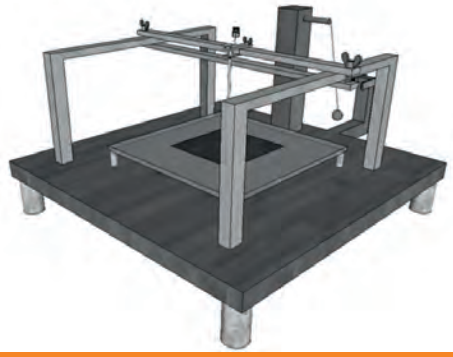

ABSTRACT

It is a system of analysis of the properties and defects of materials without specific treatment. That is the case of being able to detect defects hidden in pieces in the own line of production in real time or characterization of chemical and mechanical properties of the materials, roughly or manufactured. In addition, the system is applicable almost any type of material (fluid, solid or composite).
The proposed system consists of an isolated platform that allows the production of vibroacoustic signals by indirect impact on a resonant sheet capable of exciting the materials under study.

The excitation energy of the material is transferred by the impact vibration of a vibrating sheet to audible sound frequencies. The coupling between the material and the vibrating sheet will cause changes in the emission spectral characteristics of the vibrating sheet under normal conditions, whose analysis allows to determine the response of the material and its mechanical, chemical and structural characteristics.

ADVANTAGES AND INNOVATIONS

- Currently, practically all systems of non-destructive analysis of materials based on acoustic techniques use ultrasound. However, the proposed invention works in the audible range which causes, as we will see in the section of competitive advantages, a reduction of the costs and the technical complexity of the analyzes, that can be carried out in situ.
- When working at the audible range, it is not necessary to use gels to adapt the acoustic impedances between the measuring instrument and the material.
- When no impedance matching gels are needed, the material to be studied is not damaged.
- Allows the analysis by indirect impact of materials, both solid and liquids.
- Does not require exhaustive maintenance except for an acceptable level of cleaning.
- Ideal for aggressive environments where other systems with more fragile components could easily suffer damage.

Last updated 06/2020

4 Economy and Society

- Retailers and manufacturaters
- Industrial and service companies
- Assesment model for the portfolio of clients and loyality methodology (customering)
- Diagnosis and solutions to improve mortuary services in cementeries
- “Emotongue”: and app to manage your own emotions
- International seminar the unknows. Studies on the construction of female identity in literature
- Internacional legal advice

Universidad de Alcalá

DIAGNOSIS AND SOLUTIONS TO IMPROVE MORTUARY SERVICES IN CEMETERIES

TECHNOLOGY OFFER

Code

SOC_UAH_01

Application areas

- Socioeconomics

Type of collaboration

- Technical cooperation
- Commercial agreement with technical assistance

Main researches

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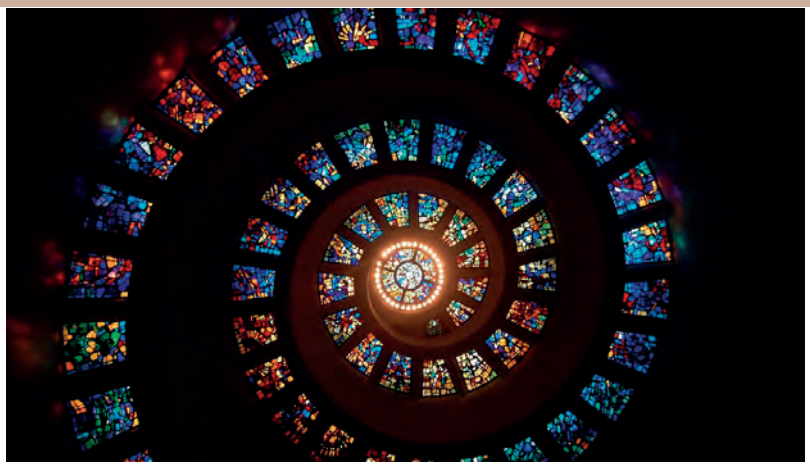

ABSTRACT

Throughout history, mutations have occurred over time with new demands and aspirations that are being introduced into the solutions and legal status of cemeteries. The municipalization of cemeteries has resulted in an intense process of secularization and assumption by the State of competences and functions that are considered proper to a State of our times. Therefore, the submission of cemeteries to the civil jurisdiction has been achieved, which leads to normal coexistence with religious cemeteries.

Religious freedom is a fundamental right guaranteed by the Constitution. Every owner of a cemetery must guarantee respect for the rites and ceremonies, habits and customs, typical of religious organizations, provided that they respect qualified values, such as the rights of others, public order, and especially, the sanitary requirements, that from the modernity preside with rigor all the legal system of the burials. The advice would be carried out by means of the elaboration of reports or guides of doings in which the posible policies or actions are collected. Those that are recomendable to implant in accordance with the current legality.

ADVANTAGES AND INNOVATIONS

The increase in the religious and cultural pluralism of society forces public authorities to respond to new demands. In order to achieve true social integration of the entire population and a peaceful coexistence with full enjoyment of fundamental rights, specific advice is needed on management practices of religious and cultural diversity.

The Research Group "Society, Law and Religion" has been working for years on research projects and advice on these issues.

The correct application of the current regulation on management of cemeteries, which constitute one of the minimum services that every municipality must provide, will suppose a competitive advantage for those municipalities, funeral centers and cemeteries of private management that take into account all the implications of the current regulations and include it within their procedures.

Last updated 06/2020

Universidad de Alcalá

FREE ONLINE COURSES IN TRANSLATION AND INTERPRETING IN PUBLIC SERVICES (SPANISH, ENGLISH,CHINESE)

TECHNOLOGY OFFER

Code

SOC_UAH_02

Application areas

- Socioeconomics
- Information and Communication Technologies

Type of collaboration

- Manufacturing agreement
- Comercial agreement
- Service agreement

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Last updated 06/2020

MOOC TISP
FITISPos
TRADUCCIÓN E INTERPRETACIÓN SSPP

ABSTRACT

MOOC course for the training of bilingual people who act as translators and interpreters in public services or in situations in which the figure of these professionals is necessary. The MOOC is available in three languages.
The online course is entitled (in English): "Get started in Translation and Interpreting in Public Services". The main objective of this course is to work on issues related to the communication process between foreign users who don't know Spanish language and public or private institutions that provide services to society. The course is also focused on describing and practicing the functions of the translators and interpreters who work in these areas and show how to get to work within this booming sector.
There are several scenarios in which the figure of the translator-interpreter becomes increasingly necessary today:

- Police Stations or State offices
- Hospitals, Outpatient Centers or Health Centers
- Non Governmental Organization (NGOs) and Volunteer Services
- Schools and Training Centers
- Companies

In these scenarios, among many others, the need for the figure of the interpreter/translator-mediator is evident and it would remain guaranteed, until a certain point, for the bilingual user who finishes the MOOC course with the qualification of PASS, without forgetting that this is about an introductory course and that subsequent specialization is needed.

ADVANTAGES AND INNOVATIONS

The development of this course is conceived as an innovative instrument in itself, since similar courses do not currently exist for the training of bilingual people outside the world of Translation and Interpreting of Public Services (TISP).
In addition, the MOOC format allows self-training, with accessible contents and totally flexible schedules for any person.

Universidad de Alcalá

"EMOTONGUE" AN APP TO MANAGE YOUR OWN EMOTIONS

TECHNOLOGY OFFER

Code

SOC_UAH_03

Application areas

- Socioeconomics

Type of collaboration

- Adquisition agreement
- Service agreement
- Technical assitance

Main researches

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ABSTRACT

Emotongue is a mobile application for android system and it is available in spanish and english. The aim of this software is helping people get to know, handle and connect with their own emotion. It is a Research Project from the Educational Sciences Department, in Universidad de Alcalá (UAH). Android Studio (An open data program developed by IntelliJ Platform) is been used for the development of the app and Firebase like data base and notification generator.

Emotongue sends five notifications every day to the user and they have two hours every time to answer them by text message or voice note. In this way, people have to stop or take a break for those moments and pay attention to their emotions and feelings.

The companies/institutions that want use this system could count with an additional service like emotional magnament courses which would be taugh by proffesionals in this field and they would be addapted to every group needs.

Nowadays, in a society where everyone is running in a hectic way and where stress and anxiety are general moods, it is important and almost required try to get an optimum pychological mood, and Emotongue can help you!

ADVANTAGES AND INNOVATIONS

- The software guarantees privacity to the user, immediacy and results in a short term.
- Emotongue makes you manifest how you feel and why, like if you were sending a message to a friend but knowing that you can´t be judge by anyone but you.
- The interface is easy and intuitive and it has the possibility of be used by spanish and english speakers. In this way, the user can train and improve their emotional bilingual vocabulary like value added.
- Companies could use Emotongue like a work environment improvment tool because if the employees mood is better, productivity will improve too.

Last updated 06/2020

Universidad de Alcalá

INTERNATIONAL SEMINAR THE UNKNOWN WOMEN. STUDIES ON THE CONSTRUCTION OF FEMALE IDENTITY IN LITERATURE

TECHNOLOGY OFFER

Code

SOC_UAH_04

Application areas

- Socioeconomics

Type of collaboration

- Commercial agreements
- Service afreements

Main researches

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ABSTRACT

In the year 2019, International Seminar The Unknown Women began. It is a study on the construction of the feminine identity in literature to know how artistic discourse constructs the figure of women. The identity is an essential element in the cognitive and emotional development of individuals and, in this sense, writing is one of the most fruitful ways for that construction. However, language can also be a tool to construct identities that do not correspond to the subject, but instead, from external and repeated perceptions, an artificial identity is reached, since language creates fictions that provoke stereotyped identities according to the sex, which conditions the perception we have of women and writers. For these reasons, it is very important to study those authors who, from a special sensitivity, have been able to transmit to us the conflict between the stereotypical identity that society assigns to women and the elaboration of a true identity.

ADVANTAGES AND INNOVATIONS

- It allows the study of gender in a transversal way, interesting for different types of students as well as other people.
- Publicizing Spanish creators, specifically, in the theatrical field, taking into account that only 23% of the works that are premiered are written by women.
- Registration for the seminar is offered both in person and online. It will be broad-cast through the YouTube channel of the University of Alcalá and we will answer to comments.
- The play *Bajo el agua* is inspired by real events, in the controversy surrounding the Spanish synchronized swimming team after the London Olympics in 2012.

Last updated 06/2020

Universidad de Alcalá

INTERNATIONAL LEGAL ADVICE

TECHNOLOGY OFFER

Code

SOC_UAH_05

Application areas

- Socioeconomics

Type of collaboration

- Service agreement
- Subcontracting

Main researches

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OTRI Universidad de Alcalá

ABSTRACT

Extensive advice on international issues to both public institutions (autonomous communities, public companies, town halls, etc.) and private companies and law firms in different matters. Advice and drafting of legal reports on:

- Issues related to private international law and international business law, especially in terms of drafting contracts (construction, technology, sales, distribution, energy, etc.), clause analysis, competent jurisdictions, law applicable to the dispute. Recognition of foreign judgments
- Internal and international arbitration and mediation: analysis and drafting of arbi-tration clauses and multifunction step clauses. Recognition of arbitration awards. Cancellation of awards. Feasibility of procedures
- Specific issues to nationality applications and immigration procedures. Advice on the drafting of legislative amendments
- Family and juvenile processes with an international element. Divorces, marriages, affiliation, etc. Recognition of foreign sentences
- Organization of specialized conferences. Teaching seminars, conferences and courses
- Development of various national and international research projects
- Specialized training for specific groups in mediation, arbitration, nationality, foreigners, international contracts, international family processes, protection of foreign minors, etc

ADVANTAGES AND INNOVATIONS

The Research Group has been working for years on research projects and advice on the issues described. Many of its members have been practicing lawyers, international arbitration advisors, arbitrators and mediators.

The continuous investigation in the different fields of the members of the Group allows to provide effective and innovative solutions

Last updated 06/2020

Universidad de Alcalá

SPANISH LANGUAGE TEACHING FOR CHILDREN AND ADOLESCENTS

TECHNOLOGY OFFER

Code

SOC_UAH_06

Application areas

- Socioeconomics

Type of collaboration

- Acquisition Agreement
- Comercial Agreement
- Subcontracting

Main researches

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ABSTRACT

This research team aims at developing the communicative competences of children and adolescents in their mother tongue as well as their foreign language in school contexts.

On the one hand, research takes a multidisciplinary approach to both theory and methodology. On the other hand, it takes into account the observation and analysis of real language use in school contexts.

In this way, language acquisition and learning processes beginning at an early age can be studied and made known. Work developed by the research team focuses on the following fields:

- The making of language corpuses reflecting school contexts in Spanish.
- The realization of studies on language learning and acquisition, and on the development of communicative competence.
- The design of materials for the teaching of Spanish as a mother tongue.
- The design of materials for Spanish as a foreign language.
- The collection of bibliography and resources for teacher training.

ADVANTAGES AND INNOVATIONS

Since this research project will be carried out from a scientific and multidisciplinary aproach, as well as from the description of real language use as utilized in school contexts, updated information on the following fields will be available:

- Language acquisition.
- Language in children.
- The development of communicative competence.
- Mother tongue learning and teaching.
- Learning and teaching of Spanish as a foreign language.
- Issues in language learning and alterations of speech.
- Corpus linguistics.
- Contrastive linguistics and error analysis.
- Educational linguistics.
- Training of teachers of Spanish as a foreign language.
- The teaching of Social Sciences.

Last updated 06/2020

Industry and Transportation

- Face tracking and pose estimation with automatic 3D model construction
- Novel full field 3D displacement measurement device
- Method and system to improve the asfa digital system incorporating virtual asfa beacons
- Intelligent transport system for the optimization of indoor shared resources: routes, communication channels and sensor networks
- Method and sensor system for the detection of trains´acles using fiber optics and time of flight cameras
- Drivesafe: app that monitors and scores your driving, generating alerts when it si not safe
- Procedure for measuring the speed of motor vehicles in the short section, with minimum error geometry, using 2 cameras and artificial vision algorithms
- Supervision system through artificial vision to monitor children when traveling in child retention systems
- Sensor system for the detection of objects/obstacles in critical points of railway lines
- Identification of vehicle brands for traffic control and access control applications
- System for reliable detection of occupancy of parking spaces

Universidad de Alcalá

FACE TRACKING AND POSE ESTIMATION WITH AUTOMATIC 3D MODEL CONSTRUCTION

TECHNOLOGY OFFER

Code

TRANSP_UAH_01

Application areas

- Information and Communication Technologies.
- Industrial Manufacture, Material and Transport technologies

Type of collaboration

- Interested in companies or institutions to conform a consortium for a project proposal to make it the system real.
- Commercial agreement with technical assistance

Main researches

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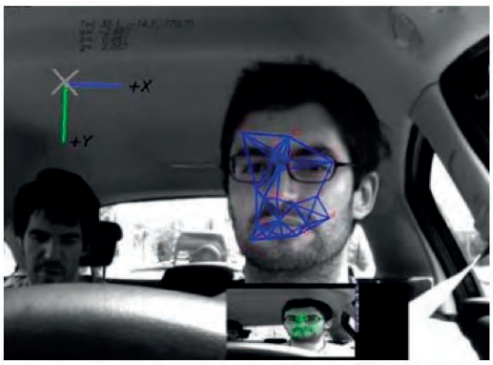

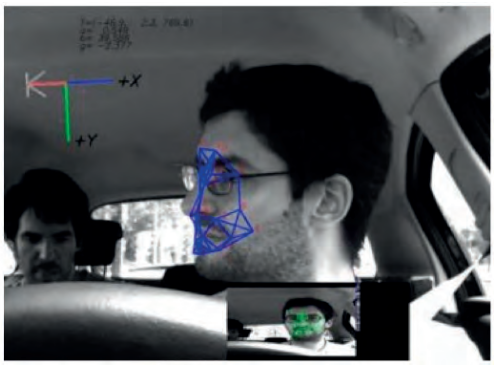

ABSTRACT

The model is formed by a set of 3D tri-dimensional points of the face. These points are automatically selected in the first image obtained from the cameras.
The face is located using Viola&Jones method, and points in the face that present adequate characteristics for tracking are found with Harris detector. Up to 30 points are used. The image patches around the 2D projections of these points on each camera are tracked on each frame, using the Simultaneous Modelling and Tracking (SMAT) algorithm. This algorithm builds a model of the changes of the appearance or texture around each point. The 3D pose is obtained from the 2D points using POSIT, redundantly for both cameras to improve robustness.

Tracking may fail for some points on each frame. RANSAC is used to discard erroneous points from the estimation of the pose. After a set of correctly tracked points (inliers) is obtained, the position of the outlier points is reset accordingly to the estimated pose. Points become occluded as the head turns and cannot be tracked. The system is able to robustly estimate the pose of the face in presence of turns of up to ±90o.

It uses a novel technique that completes the model as the face rotates and employs the method of bundle Adjustment to adjust the model. The system is able to track a driver's face robustly in real conditions. Experimental results and an analysis of the performance are ready to be presented.

ADVANTAGES AND INNOVATIONS

For the first time, this system of computer vision is able of recognizing the orientation of the human face, with no need of previous identification of the person or offline training. This system is innovative in the way of joining the three algorithms that uses for its fun- ctioning: SMAT, RANSAC and POSIT. To the best of our knowledge they had never been used before in that way.

This method works in real time (30 images per second) and it takes 33 milliseconds to execute the algorithms. It is a very robust system that keeps on working even in situations for which the model has not been designed (sudden turns of face, strong shadows, etc.). The system works with increased estimation error but tracking of the face is not lost.

Last updated 06/2020

Universidad de Alcalá

NOVEL FULL FIELD 3D DISPLACEMENT MEASUREMENT DEVICE

Patent
ES2498592

Code

TRANSP_UAH_03

Application areas

- Industrial Manufacture, Material and Transport technologies
- Measures and standards

Type of Collaboration

- Agreement of "Joint Venture"
- License agreement

Main Researchers

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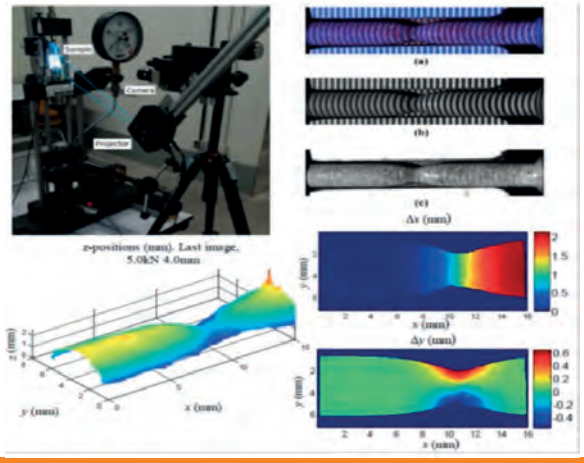

ABSTRACT

It is proposed to further promote the implementation of an alternative technique for measuring 3D displacements in the industries and research centers and, eventually, develop a commercial device. It is a low cost alternative technique to 3D Digital Image Correlation (3D-DIC), used for evaluating the mechanical performance of new designs and materials under real working conditions.
The alternative proposed system combines the two techniques of Fringe Projection and 2D Digital Image Correlation (FP+2D-DIC). It allows measuring large areas and displacements of surface elements in the three spatial direction (from which the corresponding deformation maps can be calculated).
Measurements are acquired in real-time but the sample surface must be painted with a random speckle pattern.
The main advantages of FP+2D-DIC in comparison to 3D-DIC: requires one camera in addition to a fringe projector, processing algorithms are much more simple and less expensive, especially for highs speed measurements (since it uses only one camera). However, the camera that uses FP+2D-DIC has to be RGB.
Sought cooperation types:
-Financial support for further improvement of the FP+2D-DIC,
-Industry interested in testing the equipment
-Commercialization of the equipment.

ADVANTAGES AND INNOVATIONS

- The device developed for the combined FP+2D-DIC technique is unique and has already provided results comparable to the one obtained with the commercial alternative technique of 3D-DIC.
- The improved FP+2D-DIC device will increase its performance by using new equipment (mainly a special camera and fringe projector) as well as by implementing new image processing algorithms that already have demonstrated to increase performance beyond the one offered by the commercially available 3D-DIC equipment.

The FP+2D-DIC device has been a result of collaboration between two universities, the Universidad of Alcalá and the Universidad of Jaén.

Last updated 06/2020

Universidad de Alcalá

METHOD AND SYSTEM TO IMPROVE THE ASFA DIGITAL SYSTEM INCORPORATING VIRTUAL ASFA BEACONS

Patent
ES 2418929

Code

TRANP_UAH_04

Application areas

- Information and Communication Technologies
- Industrial Manufacture, Material and Transport technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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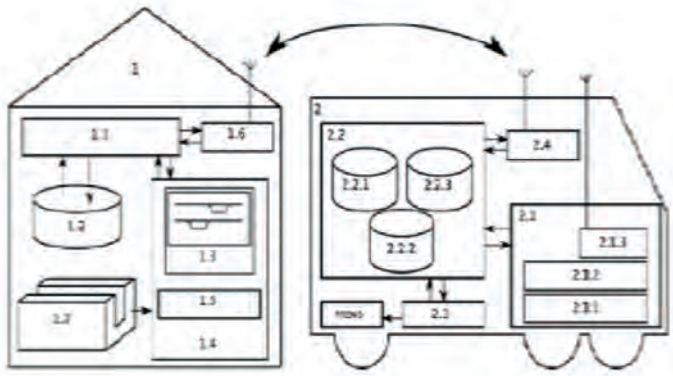

ABSTRACT

Geintra Spanish research group from the Department of Electronics of Alcala University has developed a process and system to improve the performance of ASFA Digital system, through the inclusion of virtual ASFA beacons, which replace or supplement the information of the physical ASFA beacons. The virtual beacons allow monitoring temporary speed restrictions even in the absence of physical ASFA beacons. The group is looking for companies in the railway sector to reach licensing agreements or collaboration and commercial agreements for technical assistance

ADVANTAGES AND INNOVATIONS

- It Include virtual ASFA beacons which replace or supplement the information of physical ASFA beacons located in the rail track, and especially those of temporary speed restrictions (LTV).
- The system increases the railway transport safety significantly.
- It gives accurate and updated information, at all times, that enables proper supervision of trains speed, depending on the signs and on particular conditions of each section, etc.
- Clearing potentially dangerous situations that may occur in the train circulation. In fact a large percentage of train accidents occur due to a detection fault of physical ASFA LTV beacons in track.
- It allows the detection of defective ASFA beacons and thus better maintenance of rail infrastructure, going from a corrective maintenance (once the fault occurred) to a predictive maintenance (based on the monitoring of certain characteristic parameters, to predict when the beacons will fail).
- The response time from breakdowns is reduced dramatically, it automates various processes related to operating of railway vehicles.
- The solution proposed in this patent is 100% compatible with the current ASFA Digital equipment. This solution allows to insert new functionalities in current ASFA Digital systems.

Universidad de Alcalá

INTELLIGENT TRANSPORT SYSTEM FOR THE OPTIMIZATION OF INDOOR SHARED RESOURCES: ROUTES, COMMUNICATION CHANNELS AND SENSOR NETWORKS

TECHNOLOGY OFFER

Code

TRANSP_UAH_06

Application areas

- Information and Communication Technologies.
- Industrial Manufacture, Material and Transport Technologies

Type of collaboration

- License Agreement
- Services Agreement

Main researches

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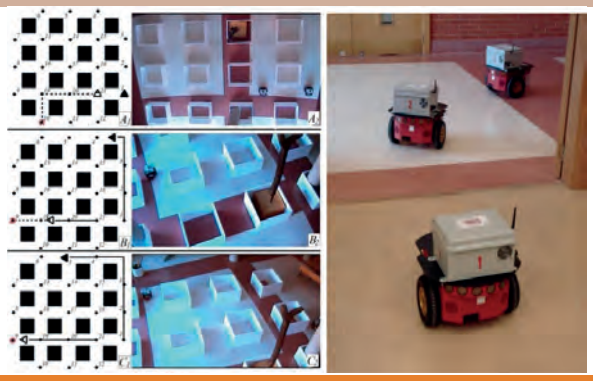

ABSTRACT

GEINTRA is a research group from the Electronics Department of the University of Alcala. The group offers solutions for route selection and digital control with adaptive sampling. It is a useful system for transport optimization and functionality of indoor mobile units.

The system has application for optimal routing techniques, with on-line adjustment along the path for the travel time optimization between two points. The solution avoids units' breakdown and waiting times in an industrial environment with multiple transport units and alternative routes.

The system also has application of remote control digital techniques with event-based sampling for indoor path tracking transport, both independently and in several units formation.

The solution uses the implementation of sensing and estimation techniques for information only when it is required to optimize the units transport, that allows to improve both energy consumption and computational cost for the sensory modules distribution.
The proposed system manages access to the shared communications network by multiple transport units and the sensors location distributed by the industrial environment, reducing the effects of channel delays and packets dropout.

ADVANTAGES AND INNOVATIONS

- The route optimization techniques represent an improvement in execution times and they can be adapted to any changes in the environment from a priori planned route solutions.
- Digital aperiodic sampling techniques, for motion control and the estimation of information from the sensor measurements, have a proven shared resources optimization compared to the classical solution of periodic sampling, such as the communication channel and the sensors network.
- With competitive advantages such as travel time optimization, selective use of the wireless communication channel and energy cost reduction for sensors distributed in the environment.

Last updated 06/2020

Universidad de Alcalá

METHOD AND SENSOR SYSTEM FOR THE DETECTION OF TRAINS' AXLES USING FIBER OPTICS AND TIME OF FLIGHT CAMERAS

Patent
ES2506590

Code

TRANSP_UAH_07

Application areas

- Industrial Manufacture, Material and Transport technologies
- Information and Communication Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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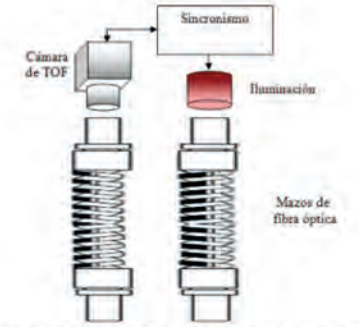

Block diagram of the proposed sensor system.

ABSTRACT

Method and a sensor system for the detection and counting of the train's axles. This sensor may be used to verify the integrity and speed of the railway convoys. This method and sensor system is characterized by its high auscultation speed.

Nowadays there are rail systems solutions to detect the train axles. One of which is the use of electromechanical and optical pedals which sends out an electrical signal when it is pressed by a wheel. Those solutions have the disadvantage that the physical contact with the wheels or track causes physical wear and the life expectancy is short. Also in high-speed trains it may skip the step of consecutive axles due to the inertia of the mechanical parts of the sensors.

Other solutions, which do not require physical contact with the trains, are electromagnetic sensors, which are not commonly used because they have problems related to the difficulty of their location. There are also possible faults arising from their sensitivity to the relative position of the transmitter, the receiver and the vibration. In order to resolve those problems, a non-invasive optical sensing system has been designed which detects the wheels without including any electronics in the tracks. This system is completely immune to electromagnetic interferences. Furthermore, by the method used for the measurements is immune to the sensor system vibration.

With this solution the measurements are made without physical contact with any element of the train, it has total immunity to electromagnetic interference (absence of electronics in the pathway) and to the sensor vibration.

ADVANTAGES AND INNOVATIONS

- Axles detector without any electronics included in the track.
- Completely immune to electromagnetic interference and sensor's vibration.
- Significantly increases the safety in railway transport.
- No electronics in railway are required.
- The system is immune to electromagnetic interference.
- There is no mechanical wear of the components.
- The system is immune to vibration.

Last updated 06/2020

Universidad de Alcalá

DRIVESAFE: APP THAT MONITORS AND SCORES YOUR DRIVING, GENERATING ALERTS WHEN IT IS NOT SAFE

TECHNOLOGY OFFER

Code

TRANSP_UAH_10

Application areas

- Information and Communication Technologies
- Industrial Manufacture, Material and Transport technologies

Type of collaboration

- Interested in companies or institutions to conform a consortium for a project proposal to make it the system real
- Commercial agreement with technical assistance

Main researches

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ABSTRACT

DriveSafe evaluates the driver behavior and generates real-time alerts based on seven indicators: accelerations, braking, steering wheel turns, position within the lane, how the driver makes the lane changes, driver behavior respecting the allowed speed in the different sections of a road and the approach maneuvers to the previous vehicle. It classifies each trip among normal, drowsy and aggressive, using the sensors of the mobile phone itself (accelerometers, GPS, rear camera), as well as access to map services (OpenStreetMap) through Internet. It uses an augmented reality interface that allows to improve the driving experience through a feedback, provided by the App, of how it is being done.

The information obtained is always available for the driver to consult after the trip, including maps with location information and risk maneuvers. All this along with videos recorded automatically in the moments in which the driving has been more dangerous.

DriveSafe also generates a series of alerts during driving, typical of advanced driving assistance systems services available in premium vehicles: accelerations, brakes and sudden turns, irregular lane changes, zig-zag within the lane, overrun of the permitted speed and dangerous approach to the previous vehicle.

ADVANTAGES AND INNOVATIONS

DriveSafe is able to calculate its position within the lane and the distance/time it is from the ahead vehicles in real time using an exclusive algorithm based on the rear camera of your Smartphone and provides real-time alerts of ADAS services that would otherwise only be available in premium vehicles.

Drivesafe provides a user-friendly interface with access to all calculated real-time indicator ratios. The information obtained is always available for the driver to consult after the trip, including maps with location information, risk maneuvers made, and automatically recorded videos at times when driving has been more dangerous. This application works in any type of vehicle and is effective even in adverse weather conditions: rain, fog, moderate snow or at night.

DriveSafe is respectful of the privacy of its users. It only uses the rear camera (focused towards the road) to analyze the route, without taking pictures of the inside of the vehicle. The information generated is stored in the vehicle itself and it is only sent to a remote server for analysis if the user consents. The application can be available in the market store of the leading mobile companies on the market, allowing global visibility and easy access to it from anywhere in the world. This application improves, on the one hand, the safety of drivers (a service that otherwise would only be available in high-end or premium vehicles), and on the other hand, a history of driving behavior is generated.

Last updated 06/2020

Universidad de Alcalá

PROCEDURE FOR MEASURING THE SPEED OF MOTOR VEHICLES IN THE SHORT SECTION, WITH MINIMUM ERROR GEOMETRY, USING 2 CAMERAS AND ARTIFICIAL VISION ALGORITHMS

Patent
ES2665939

Code

TRANSP_UAH_12

Application areas

- Industrial Manufacture, Material and Transport technologies
- Measures and standards
- Information and Communication Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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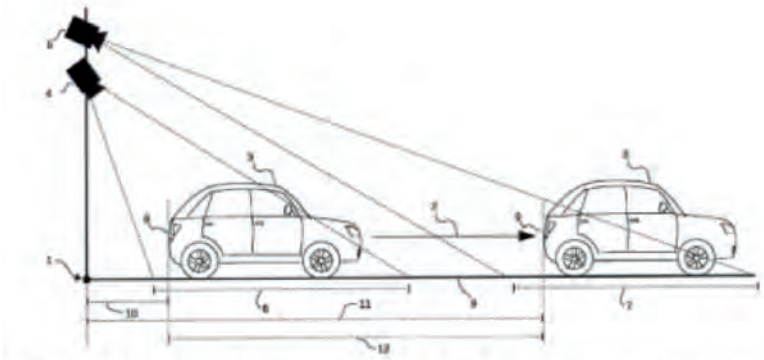

Side view of the general operation diagram. In this figure the two vehicles correspond to the same vehicle in two different time instants.

ABSTRACT

The research group in Intelligent Vehicles and Traffic Technologies of the Automation Department of the University of Alcalá has developed a procedure for the punctual measurement of the speed of motor vehicles, through the use of at least two cameras, pointing to two different regions of the track, calculating the relative distances of the vehicle from the cameras by detecting the license plate and its internal elements, storing timestamps, calculating the speed for all possible combinations of distances between cameras that are at the optimum distance that generates minimum error in the calculation of the speed and calculating the average speed of all the speed measurements obtained for optimal distances of minimum error.

ADVANTAGES AND INNOVATIONS

- The invention proposes a novel method for the punctual measurement of the speed of motor vehicles by using at least two high-resolution cameras each pointing to two different regions of the same lane.
- By using that cameras to detect the known dimensions of the license plate, the measurement error is reduced to a minimum. Artificial lighting systems are used to improve the contrast of images and maintain their effectiveness in low light conditions. All information is managed in a processor, which also allows the storage of timestamps.
- This new procedure establishes a specific criterion for minimum error of speed measurement, which is not found in other systems, by using at least two cameras located in the same point, either on a pole or on a portico, pointing each one of them to two different regions of the same lane. In this way the problems resulting from the errors in the punctual measurement of the speed are considerably reduced.
- High commercial potential at national and international level with a much lower cost than the relative cost associated with radar or laser-based point-based kinemometers.

Last updated 06/2020

SUPERVISION SYSTEM THROUGH ARTIFICIAL VISION TO MONITOR CHILDREN WHEN TRAVELING IN CHILD RETENTION SYSTEMS

Patent
ES2684607

Code

TRANSP_UAH_15

Application areas

- Industrial Manufacture, Material and Transport technologies
- Security
- Information and Communication Technologie

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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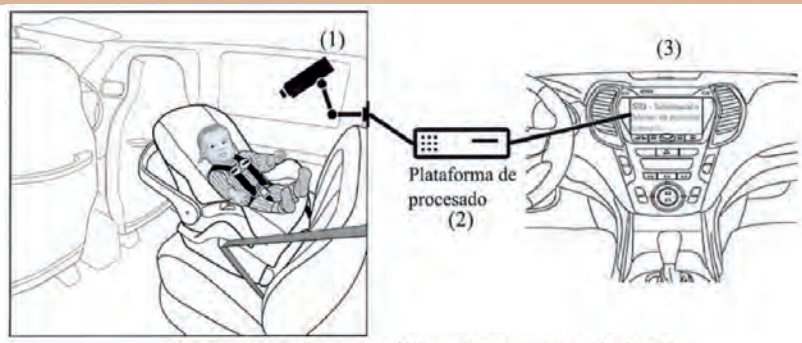

(1) Image capture system; (2) Image processing platform; (3) Communications interface

ABSTRACT

For the first time, a monitoring system is developed, which applies artificial vision and artificial intelligence techniques, to accurately monitor the pose adopted by a child traveling in a Child Retention System, notifying the driver immediately of the risk situations.

The device monitors the child continuously, automatically detecting his head, and estimating his pose accurately, while locating the different parts of the body and some fastening elements of the Retention System. The system is therefore capable of detecting situations that entail risk for the child.

The interface system allows the driver to be informed of the detected risk situations, either through audible alarms or through the vehicle's information systems.

The present invention has its field of application in the field of road safety in general, and child retention systems for vehicles in particular.

ADVANTAGES AND INNOVATIONS

- The present invention is the first to focus on the monitoring of the child traveling subject in a retention system. Unlike other similar technologies that only focus on the analysis of the driver of the vehicle (attention, fatigue, etc.) and what happens in the environment of the vehicle.
- Furthermore, the present invention monitors the head pose of the child traveling in a retention system, detecting dangerous positions in case of accident and notifying the driver.
- This invention allows to monitor not only the head but also the different parts of the body of the child, such as the torso and upper extremities, and the safety belts, to alert if the child has got rid of them or if they are in an wrong position.
- This system can be implemented in any architecture for image processing that can be embedded in a vehicle.
- It uses only artificial vision techniques and artificial intelligence, so there is no need to use additional mirrors or anti-escape systems. Only the proposed system.

Last updated 06/2020

Universidad de Alcalá

SENSOR SYSTEM FOR THE DETECTION OF OBJECTS/OBSTACLES IN CRITICAL POINTS OF RAILWAY LINES

Patent
ES2377802

Code

TRANSP_UAH_16

Application areas

- Industrial Manufacture, Material and Transport technologies
- Environment and risk prevention Electronics
- Information and Communication Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

Prof. Manuel Mazo Quintas
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Prof. Alfredo Gardel Vicente
Dr. Daniel Pizarro
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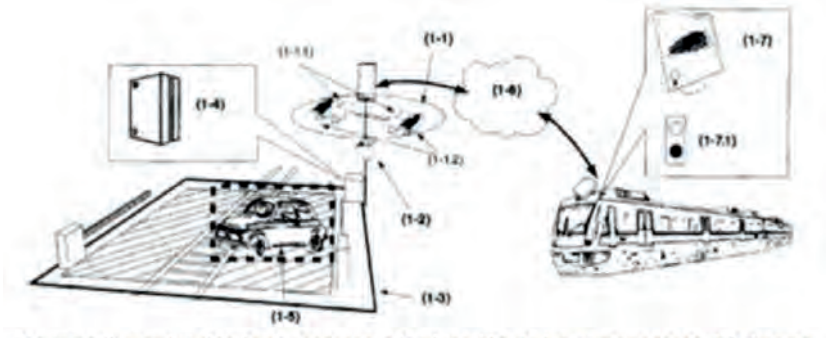

ABSTRACT

The research group in Electronics Engineering Applied to Intelligent Spaces and Transport (GEINTRA) of the Department of Electronics of the University of Alcalá has developed a sensor device and its corresponding procedure to detect the presence of any type of objects (vehicles, people, animals, etc...) in points of interest of the railway route (level crossings, tunnels, etc.), sending to the train the visual information and corresponding warning signs.
The device consists of a set of cameras located in the environment of each point of interest, an infrared lighting system, an image processing module and a wireless communication system with the train.
The system contributes to the increase of safety in rail transport, providing the machinists with visual information about the state of the conflicting points and notifying the presence of obstacles. The system is capable of detecting the presence of objects in daylight and nighttime conditions.

ADVANTAGES AND INNOVATIONS

The system includes an intelligent video processing module, whose mission is the automatic detection of possible elements that can cause an accident (with danger for the personnel on the ground, like a run over, and also with danger for the train, like a derailment).
In addition, the image processing system allows image transmission from the risk area to the train approaching the area and the detection of anomalous objects in that area and the transmission of the corresponding alarm to the train.

The proposed invention has the following advantages:

- Images in real time, and continuously, of what is happening at a specific point.
- Quick assessment of whether there is a risk situation.
- Increased safety in circulation.
- Elimination of possible human errors and facilitates the function of the machinist.
- High commercial potential at national and international level with moderate cost.

Last updated 06/2020

Universidad de Alcalá

IDENTIFICATION OF VEHICLE BRANDS FOR TRAFFIC CONTROL AND ACCESS CONTROL APPLICATIONS

Patent
ES2684607

Code

TRANSP_UAH_17

Application areas

- Industrial Manufacture, Material and Transport technologies
- Automatic

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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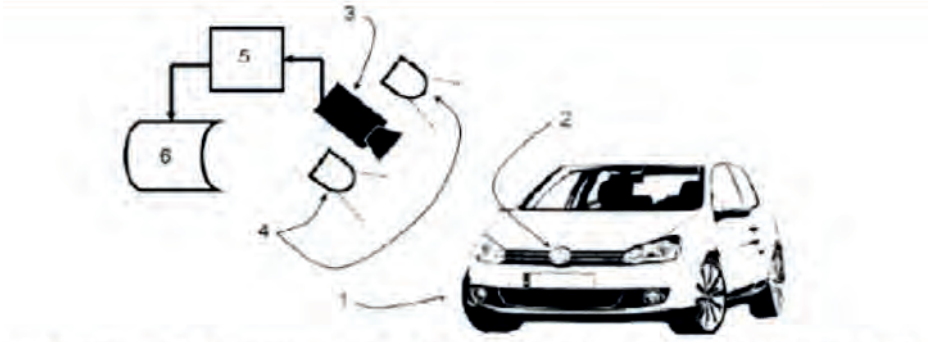

(1) Dispositivo de reconocimiento de marcas de vehículos (2) Logo del fabricante (3) Cámara (4) Sistema de Iluminación (5) Procesador (6) Sistema de almacenamiento.

ABSTRACT

Vehicle branding recognition device based on a classification procedure of the manufacturer's logo. The device consists of a camera, a lighting system, a processor and a storage system. The procedure uses the images provided by the camera that are analyzed by a processor that is also connected to a storage system.
The processor is adapted to extract information from the spatial distribution of the module and the orientation of the logo gradient, forming a vector of characteristics. The processor is adapted to classify the feature vector by running a multi-class classifier, previously trained with feature vectors from vehicle logos, to provide the most credible estimate of the vehicle's brand that appears in the images captured by the camera.
In low light conditions, the device activates one or more artificial lighting systems to improve the contrast of the images. The processor is adapted to store the images and the result of the recognition of the brand of the vehicle in the storage system for later use.
The patent object of this invention has its field of application in the industry of intelligent transport systems, companies in charge of traffic control, access control to restricted environments, as well as those in charge of integrating detection of infraction systems of vehicles on the road.

ADVANTAGES AND INNOVATIONS

- The present device proposes for the first time a mechanism for the classification of logos by means of a pattern recognition scheme.
- For the identification of the logo of the vehicles, this invention is based on the distribution of the module and orientation of the gradient of the region containing the logo.
- The present system, in addition to locating the logo of a vehicle manufacturer, is capable of classifying and recognizing it.
- So, the information that facilitates about the vehicle in question is more useful and solid than that provided with the previous classical optical.

Last updated 06/2020

Universidad de Alcalá

SYSTEM FOR RELIABLE DETECTION OF OCCUPANCY OF PARKING SPACES

Patent
ES2684607

Code

TRANSP_UAH_18

Application areas

- Industrial Manufacture, Material and Transport technologies
- Information and Communication Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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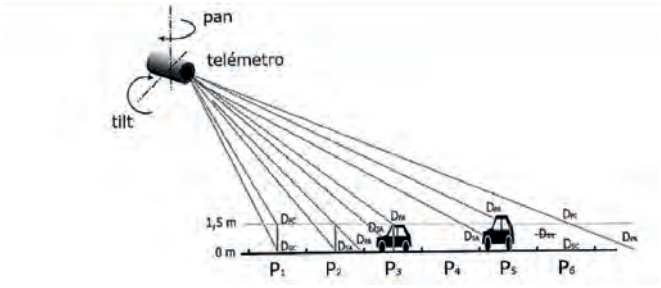

ABSTRACT

This system proposes a device that obtains the occupation status of each of the parking spaces within the area supervised by a sensor node that is composed of a video camera, a laser telemeter on a pantilt platform and a processing algorithm.
Its main features are the following:

- Camera and telemeter on a pan-tilt movement platform, as a single set of remote sensing for the detection of the occupation status of the parking spaces.
- Calibration in the installation to guide the system conveniently to the different squares of the supervised parking area.
- Algorithm of data fusion and its application to the detection of occupation of parking spaces: identification of empty spaces; vehicle entry / exit detection; fusion of video and distance data to indicate the occupation status of a place.

Once the parking occupation has been detected entirely, the system can guide the driver through his mobile phone, through an application to be developed.

ADVANTAGES AND INNOVATIONS

The novelty of the patent is mainly in the combination of the information obtained from both systems: image of the square, recognition of the space (floor) that corresponds to each parking space, detection of movement of a car in an area in the sequence of images that can mean that it occupies or leaves free a parking space close to a particular area, and the measurement of distances to the parking spaces of interest of the affected area, so that there are results of occupation of parking spaces more reliable, allowing its use in surface parking systems.
The new system includes a new distance measurement device, merging the video and distance measurements to provide an appreciable improvement in the detection of occu- pied spaces.
This new invention provides occupancy detection values of correct spaces even in low lighting conditions, brightness, occlusions, shadows, flashing lights, night operation, etc.
In addition, compared to other methods, this system gives specific information of where there is a parking space and it could also guide the user to it.
The system does not need a fixed visual demarcation of the squares in the ground, being able to vary its structure, position and dimensions of the parking spaces.
The system has a very low installation cost per space.
It does not require civil works, which is a great advantage with respect to systems that use specific luminaires and therefore require an installation in most cases very expensive.

Last updated 06/2020

Universidad de Alcalá

SYSTEM AND PROCEDURE FOR SIGNALING AND TRAFFIC CONTROL OF ROUNDABOUTS WITH ENHANCED CAPACITY AND SAFETY AND LOWER DELAYS

Patent
ES2784464 A1

Code

TRANSP_UAH_19

Application areas

- Information and Communication Technologies
- Industrial Manufacture, Material and Transport technologies

Type of Collaboration

- License Agreement
- Acquisition Agreement
- Joint-Venture Agreement

Main Researcher

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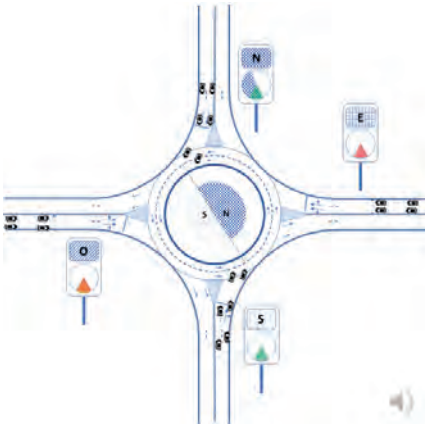

ABSTRACT

New system and procedure for roundabout signaling and traffic control, based on grouping the vehicles of each access into platoons and staggering the platoon's arrival from orthogonal directions of roundabout access.
The current roundabouts, based on the priority to the vehicles that circulate within it, provide greater security than intersections or crossings, but are quite limited, with medium and heavy traffic, due to the frequent stops of vehicles at their entrance. Major capacity and delay improvements are needed that are applicable to both conventional and autonomous vehicles.
Roundabout signaling and control must evolve by integrating traditional signaling technologies and current wireless and sensor networks. Synchronous Rotating Priorities Sectors Roundabouts (SYROPS) is proposed, a new paradigm, different from the current signalized intersections and roundabouts, for the control of traffic in roundabouts and their vicinity based on platoons of vehicles arriving at the roundabout with speed identical to the tur-ning speed in the roundabout and within the time interval assigned to his entrance, avoiding all the conflicts of passage and with it the arrests.
The system can be adopted in any country in the world with the prior approval of the corresponding traffic authority. It is very suitable for improving traffic in roundabouts with heavy traffic.
The uniform speed and timing of the arrival of priority vehicles avoid many stops at the entrance of the roundabout.

ADVANTAGES AND INNOVATIONS

- Avoids stops at the entrance of the roundabout and eliminates conflicts between vehicles within it to exit.
- The absence of stops improves capacity and delays and makes it possible to reduce the distances between vehicles safely, as there are no appreciable changes in speed
- Driving in the roundabout becomes smooth (and less pollutant) instead of stressful with sudden speed changes.
- The system is suitable for all types of vehicles, manual or automatic driving.
- The system can alternate its operation as a conventional roundabout in low traffic conditions or emergency situations, with synchronous operation with high traffic.
- It creates multiple opportunities for the development of novel display devices.

Last updated 06/2020

Environment and Energy

- Facesmart sensors for energy efficient cities
- Risk management of the effects of solar activity: device and procedure of obtaining in real time and high resolution, the local geomagnetic disturbance at middle latitudes
- Service of vegetative propagation and molecular characterization of tree species
- Upgrading lignins from lignocellulosic residues for eco-friendly lubricants and adhesives production. A biotechnological approach with industrial perspectives
- Tools for calculating the carbon stored by forests and plantantions: application to climate change mitigation
- Controller and communication system development for grid-converters applied to power quality, renewable energies and smart grid
- Eneff-pilot: a cooperative system for sustainable energy-efficent communities

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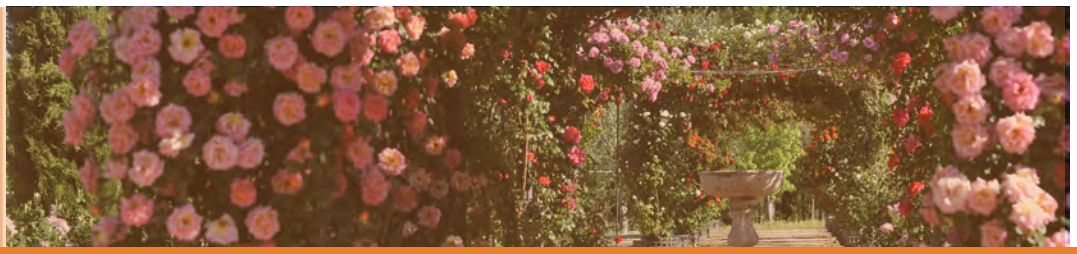

FACESMART SENSORS FOR ENERGY EFFICIENT CITIES

TECHNOLOGY OFFER

Code

ENER_UAH_06_C

Application areas

- Generation of thermal energy maps in cities
- SmartCross system for pedestrian crossing monitoring
- Improvement of thermal insulation and energy distribution systems

Type of collaboration

- Commercial agreement with technical assistance
- Manufacturing agreement

Main researches

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ABSTRACT

Smart-sensors-based technology that can be applied to improve the energy efficiency of urban environments in an holistic fashion. This technology covers areas such as Intelligent Transportation Systems and Energy Efficient Measurement applications. Thermal imaging technology is also available to identify homes and buildings that may need improvements in their isolation installations. A specially vehicle is equipped with infrared cameras, GPS and rangebased sensors. It takes thermal images of homes in winter and summer months to automatically identify buildings showing poor isolation capabilities (heat and cool losses trough poorly isolated walls, windows and roofs).

ADVANTAGES AND INNOVATIONS

In the context of transportation, innovative aspects come from the use of new sensors that provide richer information than current sensor technologies, as well as the novelty of the proposed applications. On the other hand, the automatic creation of thermal efficiency digital maps has not been proposed up to now. These maps will be very useful for local authorities to improve the energy efficiency of their local communities. A set of smart sensors have been created to optimise the use of transportation systems in urban environments. Among them we remark:

- Signalised roundabouts and intersections, adaptive to the current traffic status. Adaptive traffic monitoring and management.
- SmartCross: optimal traffic lights timing by pedestrian detection in pedestrian crossings.
- Prioritising public transport vehicles in roundabouts and intersections.
- Outdoor parking slots monitoring by a fleet of public transport vehicles applied to reduce the time needed to find a free parking slot.

Last updated 06/2020

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RISK MANAGEMENT OF THE EFFECTS OF SOLAR ACTIVITY: DEVICE AND PROCEDURE OF OBTAINING IN REAL TIME AND HIGH RESOLUTION, THE LOCAL GEOMAGNETIC DISTURBANCE AT MIDDLE LATITUDES

Patent
ES2640934B2
PCT/ES2017/070189

Code

ENER_UAH_07_P

Application areas

- Information and Communication Technologies
- Industrial Manufacture, Material and Transport technologies
- Energy, Physical and Exact Sciences
- Environment and risk prevention

Type of Collaboration

- Technical cooperation Commercial agreement and
- Technical assistance
- License agreement

Main Researchers

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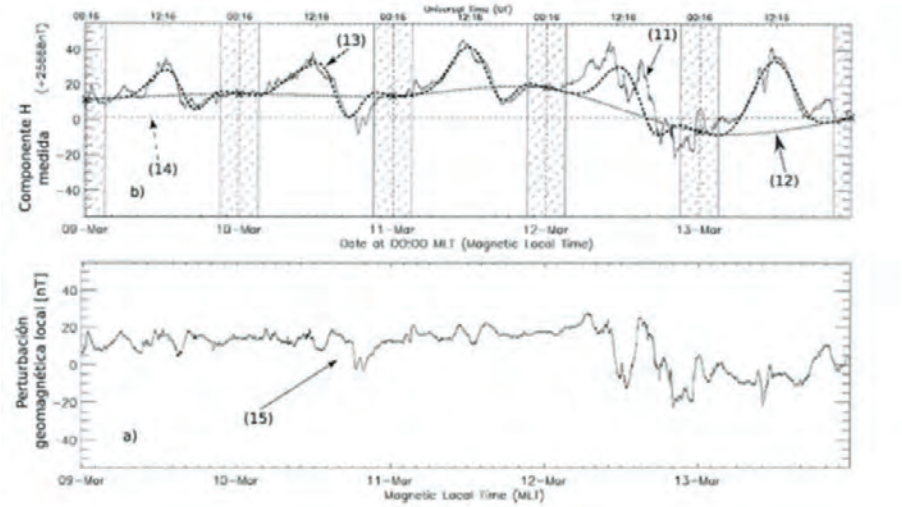

ABSTRACT

Device and procedure that, based on the measurement of the local geomagnetic field, is able to estimate the magnetic disturbance component associated with solar activity at middle latitudes. The determination of the magnetic disturbance component is especially relevant in cases of sporadic but explosive solar phenomena. The present invention describes a method and device capable of obtaining the local geomagnetic disturbance component at medium latitudes in real time and high precision (1 minute). The geomagnetic disturbance is obtained by removing different components of undisturbed geomagnetic field from the magnetic field measured on the earth's surface (solving the problems existing in the prior state of the art). In the invention, a day model in magnetic calm at medium latitudes is described for the horizontal component of the geomagnetic field. The procedure implies the characterization of a day of magnetic calm or disturbed day by evaluating the goodness of the fit of the invented model to the measured data of the horizontal component of total magnetic field, once subtracted an auxiliary curve of tendency of the night values.

ADVANTAGES AND INNOVATIONS

From the perspective of the actual user, the present invention constitutes an essential element in the risk management of the effects of solar activity on vulnerable technologies, both ground-based and satellite-based (electric power, rail transport, terrestrial and positioning navigation systems, radio and satellite communication systems ...), increasing the capacities of public administrations, civil protection and emergencies and the companies themselves, in order to prepare a successful strategy for adverse conditions related to the solar activity. The innovative character of the present invention is made possible by the application of a day model in magnetic calm at midlatitudes. At this latitude the regular magnetic variation (one day), associated with the current system generated by the solar radiation received in the Illuminated zone on Earth, presents great variability and is difficult to obtain. The model invented to determine the daily geomagnetic variation, differentiates two types of points: (a) fixed to zero intensity, in the hours of night, and (b) free in intensity, for the hours of day.

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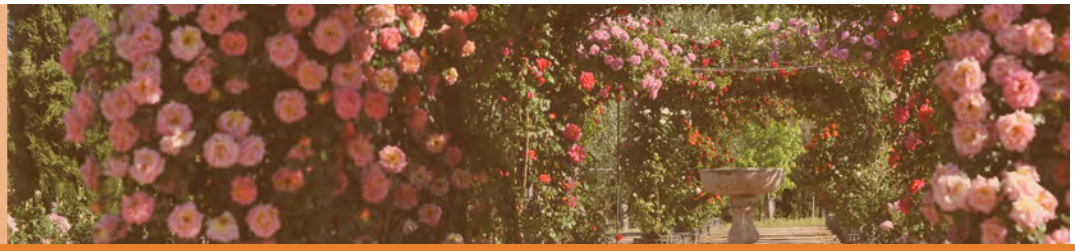

SERVICE OF VEGETATIVE PROPAGATION AND MOLECULAR CHARACTERIZATION OF TREE SPECIES

TECHNOLOGY OFFER

Code

AMBI_UAH_10

Application areas

- Energy and biomass
- Biological Sciences
- Agriculture and Marine
- Resources
- Agrofood Industry
- Environment and risk prevention

Type of collaboration

- Commercial agreement with technical assistancet

Main researches

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ABSTRACT

The research group on Agroforestry Biotechnology at Alcalá University and the INIA's Unit on Forest Tree Genomics offer a mixed service consisting of vegetative propagation and plant genotyping, mainly tree species, through in vitro culture and molecular markers of high discriminatory power.
The in vitro culture is carried out at facilities of Alcalá University, being the INIA the institution in charge of the plant genotyping for their delivery once they have been molecularly characterized. Other plants obtained by other means can be also genotyped as well.
Both institutions seek to reach commercial agreements with forestry, reforestation, horticultural companies, plant nurseries, companies specialized on cultivation of woody species to obtain biomass, agrarian transformation companies, ornamental companies and municipalities or local administrations interested in the maintenance of native species.
Also, this service would be of special interest for pharmaceutical companies in obtaining bioproducts in general (i.e. willow-Acetyl Salicylic Acid, yew-Taxol, Maritime Pine-Pycnogenol and other active ingredients), and chemical companies interested in obtaining resins and other derivatives.

ADVANTAGES AND INNOVATIONS

Both groups have experience and know-how generated in both fields; obtained from the development of research in the framework of national and international projects during the last 25 years. This know-how is the base for the development of new protocols or for the optimization of existing protocols, which progressively and actively incorporate advances in micropropagation and in vitro culture, as well as characterization of genetic variability and genotyping of forest tree species.
Experience in transfer of basic information in analysis tools for the multiplication and genetic characterization of materials provided by companies and administrations.
In vitro culture and analysis of the in vitro plants are developed by experts in specialized laboratories.
Uniformity and reproducibility of plant material, guarantee of origin, traceability, homogeneity and specific purity, varietal or clonal, obtaining a "superior" product, greater sanitary control, applicable to a wide spectrum of species, better planning during the year, save space, high multiplication rate ald lower costs.

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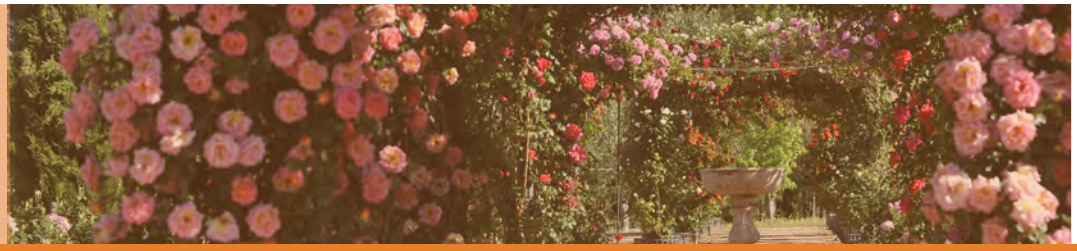

UPGRADING LIGNINS FROM LIGNOCELLULOSIC RESIDUES FOR ECO-FRIENDLY LUBRICANTS AND ADHESIVES PRODUCTION. A BIOTECHNOLOGICAL APPROACH WITH INDUSTRIAL PERSPECTIVES

TECHNOLOGY OFFER

Code

AMBI_UAH_12

Application areas

- Other Industrial Technologies
- Biological Sciences
- Environment and risk prevention

Type of collaboration

- Acquisition Agreement
- Financial Agreement

Main researches

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ABSTRACT

The use of lignocellulosic biomass for technological applications constitutes one of the most important challenges in the actual research.
Recently, we planned to take advantage of the oxidative potential of the laccases to functionalize residual lignins both derived from the microbial action on two agricultural residues very abundant in Spain (wheat and barley straws) and commercial residual lignins (i.e. Kraft lignin). Our aim was to give added value to these polymers whose accumulation in terrestrial and aquatic ecosystems cause a great environmental impact.
We analyzed the rheological and tribological characteristics of the obtained oleogels. The results achieved show the suitability of the new oleogels obtained from residual commercial lignins and straw soda lignins as eco-friendly substitutes of the commercial greases on the basis of their high robustness, high biodegradability and low toxicity when compared with industrial lubricants.

ADVANTAGES AND INNOVATIONS

Nowadays there is an increased interest to drive the research efforts to the establishment of eco-friendly and sustainable technologies. Our principal aim is to try to transform agricultural residues and their residual derivatives (i.e. lignin) with microorganisms and/or their enzymes to achieve high added value products. Taking into account this plan we would be talking about a new approach to the economy, moving from the traditional “linear economy” to a “circular economy” where the wastes generated by the productive system are reused and transformed into raw materials that would enter again in multiple points of the value chain of productive system, promoting energy saving, the use of renewable energy sources and reducing greenhouse gas emissions.
The proposed technology to obtain oleogels from residual lignins to be used as thickening agents for new formulations of eco-friendly lubricants and adhesives offer environmental and economic advantages over the commercial greases. The use of previously selected microorganisms for their ability to transform agricultural residues through the production of a wide range of oxidative and hydrolytic enzymes, as well as their enzymes to functionalize residual lignins could contribute to technical and scientific development which tries to substitute total or partially the chemical procedures by biological approaches in order to achieve the planet sustainability.

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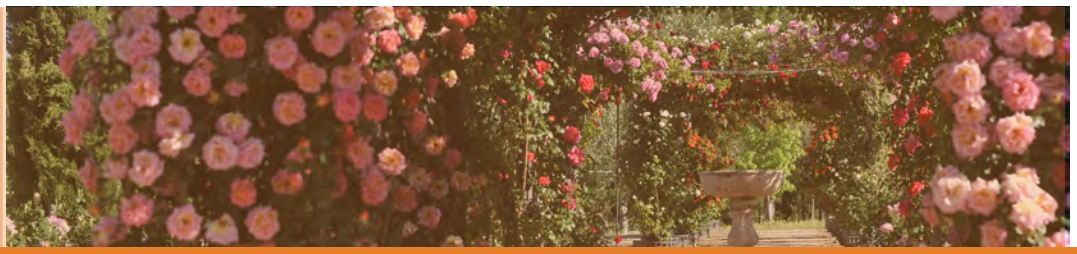

TOOLS FOR CALCULATING THE CARBON STORED BY FORESTS AND PLANTATIONS: APPLICATION TO CLIMATE CHANGE MITIGATION.

TECHNOLOGY OFFER

Code

AMBI_UAH_13

Application areas

- Socioeconomics

Type of collaboration

- Service agreement

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FORECO
FOREST ECOLOGY & RESTORATION

ABSTRACT

Tree planting and reforestation are an increasingly frequent initiative as an instrument to mitigate climate change. However, for these actions to be effective and not a mere advertising instrument, they must be done under certain technical conditions that ensure their reliability. Simulation models and forest models that have been developed allow the calculation of the amount of carbon in a forested area based on the species that make it up, its density, climatic and edaphic conditions, as well as the amount of emissions. Furthermore, technical support can be offered to the monitoring process, species selection and implantation of the forested area for its long-term endurance.

Models are available to estimate the carbon fixed by tree plantations and natural forests based on the type of species and climatic conditions, as well as an analysis of risks against extreme events and economic valuation of the climate regulation service. These models have been developed through individualized monitoring of millions of trees and big data algorithms. The tools developed make it possible to plan the planting of trees according to climatic objectives and to maintain other ecosystem functions.

ADVANTAGES AND INNOVATIONS

- Models have been contracted for all of Europe and with active monitoring of more than five million trees.
- Big data modeling approaches are available to project the dynamics of forest ecosystems in different scenarios of climate change and management.
- The models have been widely validated and include error analysis.
- Good for companies that want to offset emissions. Public administrations that want to carry out reforestation to offset emissions.

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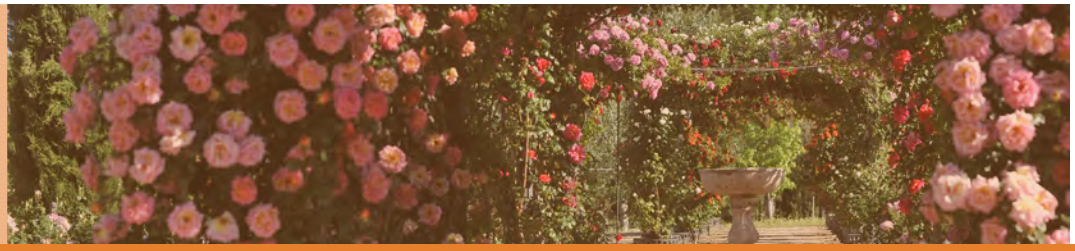

CONTROLLER AND COMMUNICATION SYSTEM DEVELOPMENT FOR GRID-CONVERTERS APPLIED TO POWER QUALITY, RENEWABLE ENERGIES AND SMART GRID

TECHNOLOGY OFFER

Code

ENER_UAH_01

Application areas

- Energy

Type of collaboration

- Joint Venture Agreement
- Services Agreement

Main researches

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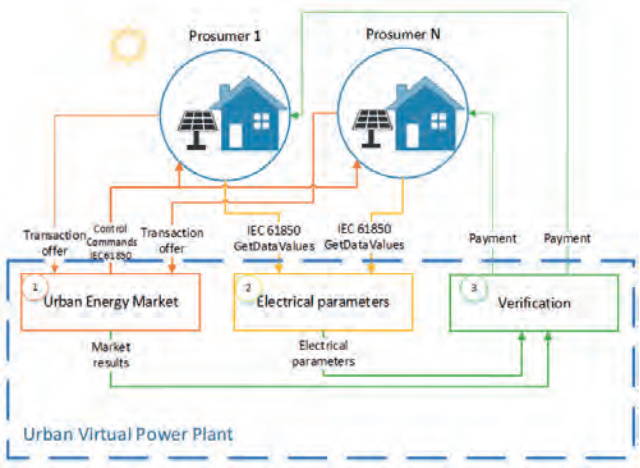

ABSTRACT

The research group "Electronic engineering applied to renewable energy systems", has worked since 2005 on projects with both public and private companies in the development of communication and control systems for power electronic converters that operate as interface with the power grid, to improve the quality of electric power (power quality) and to integrate renewable energy sources. The technology developed addresses issues such as remote control of converters, application of grid codes in the case of grid faults, operation and compensation of voltage sags, power factor compensation and harmonic, smart grid communications, virtual power plant implementations, etc

ADVANTAGES AND INNOVATIONS

- Communications systems that allow high-level control systems for power quality improvement or renewable energy sources.
- Development of algorithms to verify grid operation codes.
- Development of algorithms to detect isolated mode of operation.
- Algorithms to optimize the quality of electrical energy.
- Algorithms to compensate harmonics and phase shift factor.
- Energy efficiency in rail transport.
- Control and communications in intelligent networks (smart grids).
- Energy management solutions to optimize the revenue of distributed renewable sources.
- Energy trading managers based on IEC61850 standard and Blockchain technology.
- Forecasting algorithms to predict generation and consumption.
- Own test benches of renewable energy.

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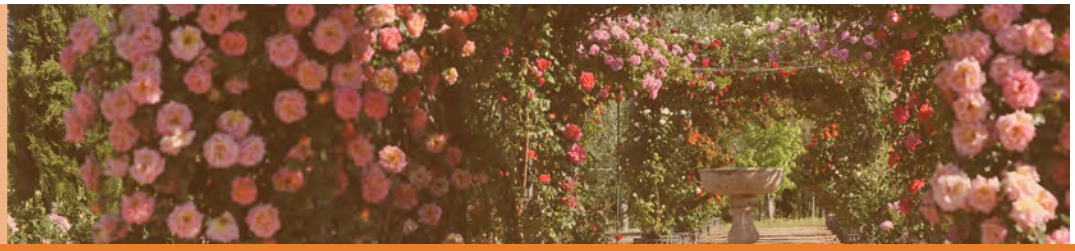

ENEFF-PILOT: A COOPERATIVE SYSTEM FOR SUSTAINABLE ENERGY-EFFICIENT COMMUNITIES

TECHNOLOGY OFFER

Code

ENER_UAH_08

Application areas

- Information and Communication Technologies
- Energy
- Physical and Exact Sciences

Type of collaboration

- Manufacturing Agreement
- Outsourcing Agreement
- Subcontracting

Main researches

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ABSTRACT

The ever-increasing technological development over the last decades has significantly changed the energy efficiency environment. The research presents a cooperative demand response system aimed at promoting behavioural changes in small and large communities.

This project aims to provide sustainable and socioeconomic evidence for the Information and Communication Technology investment within the new IoT applications such as smart metering infrastructures that promote energy efficiency in residential dwellings. A cooperative demand response system is designed to promote behavioural changes in small or large communities with common interests. The involved entities will reach binding agreements and coordinated behaviour.

Consumers will adapt their energy consumption cooperatively on a centralised way, that is, sharing their demand schedule with a data collector, which facilitates the integration of energy consumption information into a common view. This integration is performed over the so-called Aggregator, an optimal system providing energy management services in order to efficiently manage demand. It allows to distribute locally the energy provided according to the availability of renewable resources. This energy management system will be connected to the Utility defined as a set of energy suppliers shared by customers.

The pilot system will demonstrate that a community of consumers cooperating based on their energy demand analysis can realize the potentials of energy saving measures. At the same time, the system will lead to a behavioral change in the electricity consumption habits through sustainability and environmental protection goals. Main goals:

- To offer alternative resources in terms of accessibility and demand
- To develop of an energy efficient system

ADVANTAGES AND INNOVATIONS

- The system will lead to improved scenarios of energy efficiency by applying strategies for energy demand response applied to smart residential communities.
- Consumers will have the opportunity to reduce their electricity cost and/or peak-to-average ratio through scheduling their power consumption.
- The system will integrate the electricity supply available from renewable energy sources into the scheduling process.
- The research will provide empirical comparison of the developed algorithm design on different implementation strategies for player turn selection, optimisation heuristics as well as case scenarios of community's consumption patterns

Last updated 06/2020

Chemistry and Materials

- New organo-metallic catalysts for the manufacture of polymers
- Improved process for selective oxidation of sulfide groups to sulfone by silsesquioxane catalysts
- Disposable electrodes based on filtered nanomaterials
- Heterogenized NHC complexes of palladium and their uses as recoverable catalysts
- Very active aluminium catalysts in glycidyl methacrylate ring opening polymerization, for applications in electronic devices
- Portable device to detect, diagnose and monitoring of tyrosinemia

Universidad de Alcalá

NEW ORGANO-METALLIC CATALYSTS FOR THE MANUFACTURE OF POLYMERS

TECHNOLOGY OFFER

Code

QUI_UAH_01

Application areas

- Industrial Manufacture, Material and Transport technologies
- Other Industrial Technologies
- Agrofood Industry

Type of collaboration

- Joint venture agreement
- Manufacturing Agreement

Main researches

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ABSTRACT

Searching for catalytic processes directed towards the synthesis of new polymers and functionalized organic products (esters, epoxides or alkylsilane), is a topic of great interest followed by the companies of this sector. The obtaining of catalysts that can carry out these reactions more efficiently and selectively, provides a source of profits for these companies since the consumption of material and energy resources can be reduced drastically. Besides, the reduction or elimination of non-biocompatible metal charge of these polymers is essential to industrial scale, being controlled maximum permissible levels for those polymers used in food and agriculture fundamentally.

The new technology presented is develop with new catalysts based on coordination complexes and organo-metallic compounds of metals from the first groups of transition, alkali or alkaline earth metal and aluminum. Its special features allow them to be used in a wide range of sectors, including food industry, construction and petrochemicals.

ADVANTAGES AND INNOVATIONS

Due to its high efficiency, catalyst has to be used in small quantities allowing reaction products almost clean. This allows obtaining high quality polymers, also highly competitive in the market, because of the metal levels obtained, that are below than those required by the directives in the field of food and agriculture.

- New organo-metallic catalysts are highly selective
- They are very effective in the polymerization process
- The polymers obtained contain less amount of waste metal
- Biocompatible metal complexes for the synthesis of biopolymers

Last updated 06/2020

Universidad de Alcalá

SYNTHESIS OF DENDRITIC SYSTEMS OF NANOSCOPIC SIZE FOR APPLICATIONS IN BIOMEDICINE

TECHNOLOGY OFFER

Code

QUI_UAH_02

Application areas

- Biological Sciences

Type of collaboration

- Joint venture agreement
- License agreement

Main researches

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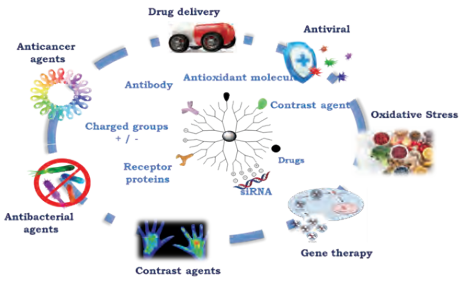

ABSTRACT

This technology consist in the synthesis and structural characterization of dendritic systems of nanoscopic size with applications in different fields of biomedicine. Among all of them the group launches the development of these systems for the transport and release of drugs as a vehicle of transfection in gene therapy or as therapeutic agents. The technology lies in the preparation of molecules of nanoscopic size based on dendritic systems or hyperbranched polymers that contains a carbosilane skeleton and are functionalized in the periphery with groups from different nature with the objective to provide them with activity focused in different biomedical aims. The group can emphasize the development of cationic dendrimers appropriate for the transport of anionic drugs or as non viral vehicles in transfection proces- ses in gene therapy, because of its capacity to join biomolecules with negative charge as oli- gonucleotides or siRNA.

These cationic systems can also act as therapeutic antibacterial agents or as anti-prionic agents. Cationic dendritic systems of carbosilane type are able to join by an electrostatic in- teraction oligonucleotides or small RNA of interference (si RNA), making complexes that have proved not to be toxic in concentration among 1-5 µm. These complexes are able to interna- lise the genetic material inside different types of cellular lines and in some cases they have showed a great efficiency in the inhibition of HIV. It is useful in processes of transfection of plasmids to different cellular carcinogenic lines in vitro and in vivo.

Regarding the antibacterial capacity of these cationic systems, the group has proved that they present a great activity against gram + bacteria and gram – bacteria, and in addition, there are signs of strengthening of the antibacterial activity of penicillin when it joins one of the dendritic systems. It allows also the preparation of anionic systems that present an im- portant antiviral activity, mainly against HIV. These

ADVANTAGES AND INNOVATIONS

- Cheaper preparation than other commercial transfection agents.
- Minor toxicity than other commercial transfection agents.
- Levels of transfection similar or superior to commercial alternatives (depending on the cellular line used)
- Antibacterial capacity against to a wide spectrum of bacteria
- Regarding the anionic systems developed, the competitive advantages are the following:
- They present a great antiviral capacity, mainly against HIV virus.
- They have antiinflammatory activity.
- They can be in use in the development of a microbicide gel of topic use.

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IMPROVED PROCESS FOR SELECTIVE OXIDATION OF SULFIDE GROUPS TO SULFONE BY SILSESQUIOXANE CATALYSTS

Patent
ES2415529

Code

QUI_UAH_05

Application areas

- Other Industrial Technologies
- Biological Sciences
- Environment and risk prevention

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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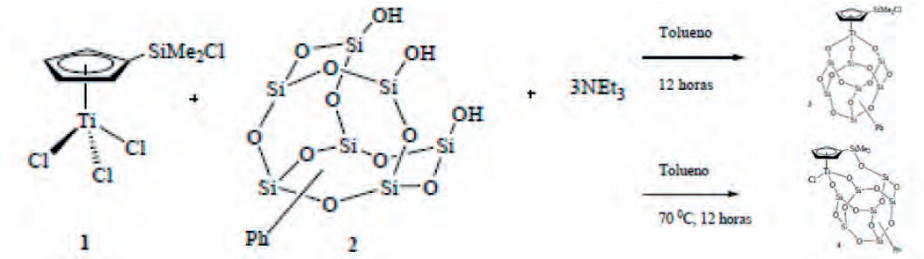

ABSTRACT

The present invention is based on the synthesis of titanium silsesquioxane compounds and its applications in oxidation catalyst of organic sulphur compounds using as oxidant tert-Butyl hydroperoxide and hydrogen peroxide.
In a first aspect, the present invention relates to the synthesis of the catalysts. The general procedure consists in the reaction of the titanium compound (1) with the partially condensed silsesquioxane compound (2) in the presence of a base such as trimethylamine all dissolved in an apolar solvent such as toluene.
The Catalyzing of oxidation of sulphides is the oxidation of the functional sulfide group to the functional sulfoxide group or sulfone, or both. It is carried out in presence of a titanium catalyst and a peroxide as a source of oxygen that could be TBHP o H2O2. It is used as a solvent, a nonpolar or aprotic medium, if the peroxide is TBHO or a polar or protic medium if the peroxide is H2O2. The process is carried out at atmospheric pressure and room temperature. On the assumption that both oxidation products are obtained, by adding another equivalent of peroxide, the reaction evolves over time toward the maximum oxidation product, which is sulfone.
The products are obtained in high capacity and purity

ADVANTAGES AND INNOVATIONS

- The catalysts are easy to synthesize and in the synthesis process is generated triethylammonium chloride, an inert inorganic salt, as the only byproduct derived therefrom. This salt is easily disposable by filtration.
- The catalysts are resistant to degradation under the conditions of catalysis.
- The titanium catalysts are slightly toxic. According to the International Agency on Cancer Research, titanium is not classified as a carcinogen element to humans.
- The Catalysis process can be performed without an inert atmosphere.
- The process shows improvements in the selectivity of the process, reaching capacities of a 100% in obtaining the sulfoxide.
- Once the sulfoxide has been generated, the same catalyst can be used for the synthesis of the sulfone.
- The oxidant used, preferably H202, is safe for the environment. Since the byproduct generated is water.
- The conditions of pressure and temperature are easily accessible.
- The procedure is simple, efficient and cheap, since the compound that would represent a higher cost, which is the catalyst, is used in a very low proportion.

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DISPOSABLE ELECTRODES BASED ON FILTERED NANOMATERIALS

Patent
ES2554203 (B2)
PCT
WO2015193520A1

Code

QUI_UAH_06

Application areas

- Industrial Manufacture, Material and Transport technologies
- Other Industrial Technologies
- Agriculture and Marine Resources
- Agrofood Industry
- Environment and risk prevention

Type of Collaboration

- Commercial Agency Agreement
- License Agreement

Main Researchers

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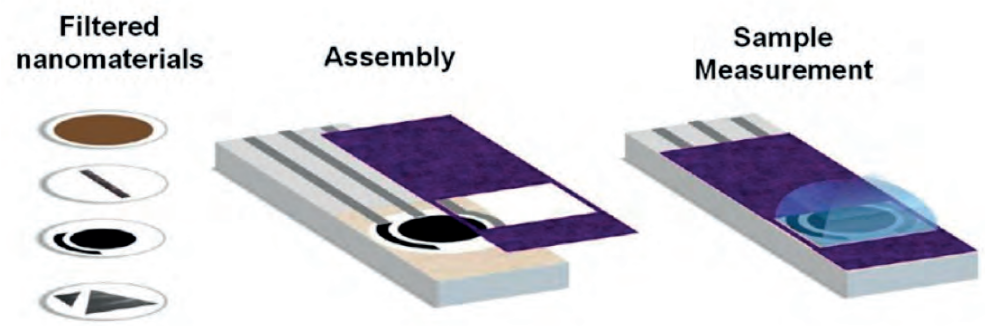

ABSTRACT

The analytical measurement has been important to progress in various areas of medicine, environment and industry. Disposable electrochemical electrodes, and particularly, screen-printed technology stands out because of its low cost and simplicity in electrical transduction.
Carbon nanomaterials among which are included, graphene and carbon nanotubes are one of the most important groups in the field of analytical detection, due to their excellent superficial properties, involving a much improved detection in terms of selectivity, sensitivity and reproducibility of chemical measurements.
Although commercial availability of electrodes constituted by only nanomaterials is zero, being applied mainly in the field of telecommunications, and it has developed a novel technology employing single-walled carbon nanotubes through which the material is embedded by direct pressure on a hard and non-conductive support by the use of hydraulic presses. The present invention provides an ideal alternative for the development of new electrodes based on conductive nanomaterials without any sophisticated equipment for its development. The most important characteristic for the development of this technology is the use of nanomaterials which are good electrical conductors.
The invention consists in the design and development of two types of electrodes:
Working electrodes, based on nanomaterials for use in conventional electrochemical cell, miniaturized or microfluidics.
Sensors based on conductor nanomaterials in which working and auxiliary electrodes are conductor nanomaterials and a reference electrode is painted with silver.

ADVANTAGES AND INNOVATIONS

- It is not need to use inks/ polymeric coatings that can reduce or modify the electrochemical signal, in contrast with traditional screen-printed/inject printed technologies.
- It allows increased surface area and avoids losses of nanomaterials, common in screen-printed processes (which wastes nanomaterial during the process) and the losses in the transferring process from bucky papers to polymeric surfaces.

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HETEROGENEIZED NHC COMPLEXES OF PALLADIUM AND THEIR USES AS RECOVERABLE CATALYSTS

Patent
ES2555328
PCT
WO2015197891

Code

QUI_UAH_07

Application areas

- Industrial Manufacture, Material and Transport technologies
- Other Industrial Technologies
- Agriculture and Marine Resources

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

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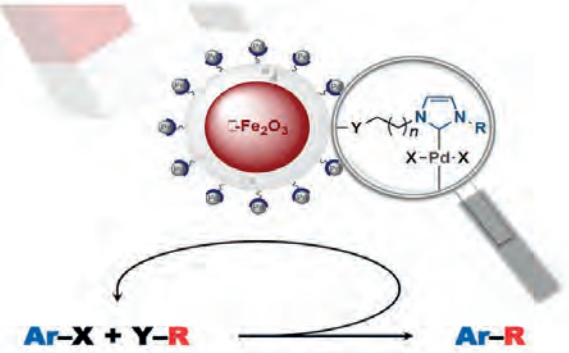
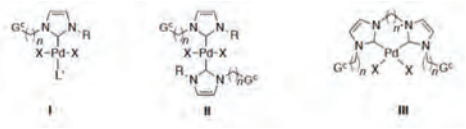


ABSTRACT

This invention involves the synthesis of (NHC) palladium complexes (PCs) with suitable substituents for their covalent grafting onto magnetic nanoparticles (MPs), resulting in nanomaterials containing the supported complexes (CMPs) as unique and well defined species of palladium tightly bound to the support. The CMPs give rise to stable dispersions in water and catalyze carbon-carbon bond formation processes in aqueous medium under mild conditions.
The invention is related to different aspects:

- New PCs of typologies I, II, and III.



- Synthetic methods for the new PCs of types I, II, III and their precursors.
- Procedures for the immobilization of types I, II, and III onto magnetic particles (MPs) of iron oxide to generate magnetic particles containing the supported complexes (CMPs).
- Use of such CMPs as catalysts for carbon-carbon coupling reactions.

ADVANTAGES AND INNOVATIONS

These catalysts are well defined, and after their use are easily separated from the products without degradation, they can be reused and do not contaminate the product with leached palladium, resulting in products of the catalysis with contents of less than ten parts per million, and sometimes even in the order of parts per billion, after magnetic separation of the particles.
The advantages of these catalysts are:

- Activity under mild conditions and in aqueous media.
- Robustness of the catalyst, which leads to a very high productivity.
- Ease separation from the catalytic products.
- Very low levels of palladium leaching, leading to products in which further work up to eliminate that metal it is not necessary.

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VERY ACTIVE ALUMINUM CATALYSTS IN GLYCIDYL METHACRYLATE RING OPENING POLYMERIZATION, FOR APPLICATIONS IN ELECTRONIC DEVICES

Patent
ES2610432 A1

Code

QUI_UAH_08

Application areas

- Information and Communication Technologies, Electronic
- Biological Sciences, Chemistry

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main Researchers

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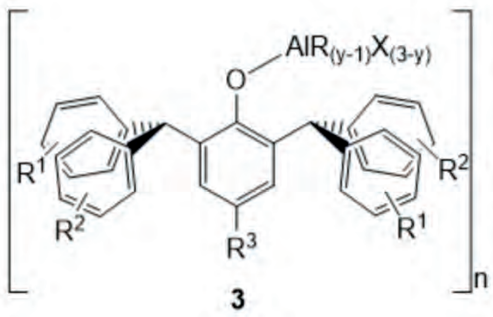

3

R^1 y R^2 = H, alkyl, haloalkyl, alkoxide, dialkylamine, halodialkylamine, hydroxyalkyl or nitrile
R^3 = H, alkyl, haloalkyl, cyanoalkyl, alkoxide, dialkylamine or nitrile
R = H, alkyl, alkenyl, alkynyl, aryl or alkoxide
X = halide.

General scheme of the aluminum catalysts type (3) used for the glycidyl methacrylate Ring Opening Polymerization processes described

ABSTRACT

This involves the synthesis of aluminum compounds of type (3) and the applications that these compounds have as catalysts in the ROP polymerization of glycidyl methacrylate in the absence of initiators or cocatalysts at room temperature and in short periods of time.

The compounds to which this invention refers can have different isomers or can be solvated or in the form of salts.

The glycidyl methacrylate ring opening polymerization processes are carried out in the presence of an aluminum catalyst of type (3) using an apolar medium, such as toluene as the solvent. The process is carried out at atmospheric pressure and room temperature.

This polymerization process shows a series of important advantages.

ADVANTAGES AND INNOVATIONS

- Catalysts are resistant to degradation under catalysis conditions
- They are carried out at room temperature and at atmospheric pressure
- The use of initiators or cocatalysts is not required for the polymerization process to take place
- Conversions are elevated to short polymerization times
- The procedure is simple, efficient and cheap, since the compound that would represent the greatest cost, the catalyst, is used in a very low proportion..

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PORTABLE DEVICE TO DETECT, DIAGNOSE AND MONITORING OF TYROSINEMIA

Patent
ES2679375 A1

Code

QUI_UAH_11

Application areas

- Other Industrial Technologies
- Biological Sciences
- Measurements and standards

Type of Collaboration

- Acquisition Agreement
- Manufacturing Agreement
- Outsourcing Agreement

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ABSTRACT

The fast diagnosis and monitoring of tyrosinemia are essential to avoid the serious complications of this disease such as hepatic damage, mental retardation or even death in the first days of life without a diagnosis. Additionally, there is no and efficient treatment yet so patients have to control their disease during the whole life to avoid the serious damages.

This invention consists on a fully integrate and portable device for in situ and fast tyrosinemia sensing composed by: (i) disposable electrodes based on filtered nanomaterials and (ii) an electronic device what includes a miniaturized potentiostat for the electrochemical measurements coupled to a software to become the electrochemical current into a digital signal (number or lights) and a simple hardware for an easy interpretation by a non-specialized user. The hardware would be composed by a miniaturized potentiostat, on/off and start/stop buttons, a screen and lights for signal interpretation by the user and a hole to insert the disposable electrode; all integrated into a single portable device.

ADVANTAGES AND INNOVATIONS

- Due to the grave effects of tyrosinemia and its associated problems, a fast diagnosis and strict control during the whole life has to be carried out. However, current control of tyrosinemia involves a tedious process in specialized laboratories as well as expensive and very time-consuming methods which provoke a delay in diagnosis and monitoring, which is very dangerous for patient's survival and to their quality of life later on.
- Thus, this invention is a portable and easy-to-use device, use very few amounts of sample (50 µl) and perform fast analysis (1 minute), which become it into a very valuable approach for tyrosinemia diagnosis and monitoring by the non-specialized user. So, the present invention is an ideal alternative for fast diagnosis and monitoring since there is not any commercial availability of portable devices for tyrosinemia yet, so it would be the first device commercially available to this aim.
- Possible use for other diseases related to tyrosinemia and uric acid as a biomarker.
- Simple and fast technology (1-minute-long analysis and 50 µl of the sample) using one single device coupled with disposable electrodes that can be exploited commercially.
- It does not need any sophisticated equipment for their use.

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Tic´s

- ICT APPLICATIONS BASED ON QR CODES AND RFID IN TEACHING AND RESEARCH LABORATORIES
- ARP-PATH SHORTEST PATH BRIDGES (FASTPATH ETHERNET TRANSPARENT BRIDGES)
- PROCEDURE TO REPAIR CLUSTERED ROADS IN FAILURE AND ARP-PATH/ALL-PATH NETWORK BRIDGE
- DIFFERENTIAL DETECTION SYSTEM OVER OPTICAL FIBER BASED ON BRILLOUIN STIMULATED SCATTERING
- SYSTEM AND METHOD OF DISTRIBUTED CONTINUOUS CHARACTERIZATION OF AN OPTICAL FIBER MEDIA
- DEFINITION AND DESIGN OF EFFICIENT ARCHITECTURES FOR ADVANCED ELECTRONIC SYSTEMS
- SIGNAL DEMODULATING DEVICES THROUGH A WAVELET OFDM RECEIVER
- CATCHAPS/HIPS TO TEST AND IMPROVE THE SECURITY
- TCARE ROBOTIC SOLUTIONS FOR TELECARE
- DISTRIBUTED CHARACTERIZATION SYSTEM AND METHOD OF VARIATIONS OF THE REFRACTIVE INDEX OF AN OPTICAL FIBER
- MODE-LOCKED PULSED LASER USING SATURABLE ABSORBER
- INTERACTIVE PLANT CELL : EDUCATIONAL ROBOTICS PROJECT
- NOVEL SYNCHRONIZATION PROCESS FOR MULTI-CARRIER OR SINGLE-CARRIER COMMUNICATIONS
- SYSTEM OF INTELLIGENT PROBES OF MONITORING APPLIED TO OBJECTS OF DAILY USE, FOR THE DETECTION OF NEURODEGENERATIVE DISEASES OR DEVIATIONS IN THE TYPICAL DEVELOPMENT OF A PERSON
- PROCEDURE OF STABLISHMENT, ERASING OF PATHS AND FORWARDING FRAMES FOR TCP TRANSPORT CONECTIONS AND NETWORK BRIDGE
- ESTABLISHMENT, REPAIR AND DELATING PROCEDURE OF DISJOINT MULTIPLE PATHS, REDIRECTION OF FRAMES AND NETWORK BRIDGE. MULTIPLE DISJOINT PATHS (MDP)
- COOPERATIVE PROCEDURE SDN-REPAIR NETWORK FOR FAULTY PATHS AND NETWORK BRIDGE
- SYSTEM AND METHOD OF DISTRIBUTED CHARACTERIZATION OF DISPERSION PROFILE OF AN OPTICAL FIBER
- ADAPTATION OF A LEARNING PLATFORM TO THE PERSONAL NEEDS OF THE STUDENT. IMPROVEMENT OF THE ACCESSIBILITY IN ONLINE EDUCATION
- SYSTEM FOR IMPROVING ACCESSIBILITY IN LEARNING PLATFORMS BY USING PUSH BUTTONS FOR PEOPLE WITH MOTOR DISABILITIES
- EFFICIENT SENSING TECHNIQUES FOR SMART CITY APPLICATIONS
- INTELLIGENT SYSTEM FOR AUTONOMOUS CONTROL IN ROBOTICS COOPERATION
- SYSTEMS AND APPLICATIONS BASED ON INDOOR POSITIONING VIA LED-LIGHTING
- SEQUENCEPRO19: SOFTWARE FOR THE ANALYSIS OF DNA AND PROTEINS

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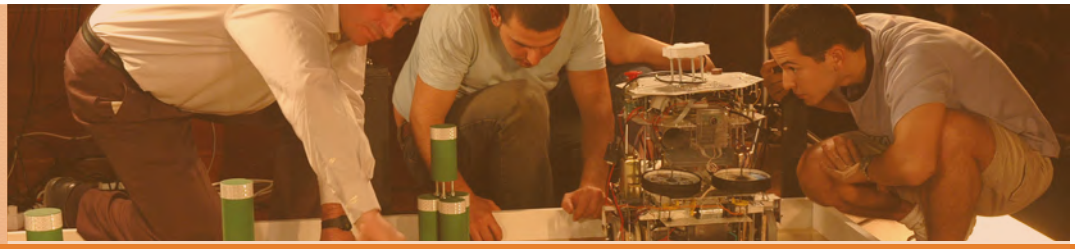

ICT APPLICATIONS BASED ON QR CODES AND RFID IN TEACHING AND RESEARCH LABORATORIES

TECHNOLOGY OFFER

Code

TIC_UAH_02

Application areas

- Information and Communication Technologies

Type of collaboration

- Interested in companies or institutions to conform a consortium for a project proposal to make it the system real
- Manufacturating Agreement
- Services Agreement

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ABSTRACT

The query of the equipment manuals, devices and instrumentation used in teaching labo- ratories of RF through the use of passive RFID labels on measuring devices and instruments used in each practice allows the access to document database or video tutorials in which various aspects are developed related with the practice, such as the description of the devices and the steps to follow to the measurement of its parameters (equipment calibration, wiring and sequence of the commands), allowing the performance and the interpretation of the measures.

The same functionalities can be achieved by replacing the RFID labels for QR codes, whose capture will allow to access to the same database. In this case, a cheapening is achieved since it is not necessary the use of labels or RFDI reader.

The implementation of an App to read the label or the QR code, and redirect the user to the information available on the portable device itself or in an external server through an Internet connection via broadband mobile 4G or Wi-Fi -will provide students and researchers to resolve the doubts rose in the performing of their practices.

The key features of the system are based on the characteristics of the technologies used, being extended to any area of the laboratory practice of any subject. Thus, the use of ICT is favored by students and researchers, facilitating their access to user manuals of the measuring equipment and directing them to the tasks of self-learning.

ADVANTAGES AND INNOVATIONS

- Use of RFID and QR codes in educational environments or research laboratories.
- Simplification of equipment manuals use.
- Possibility of inclusion of video tutorials.
- Strengthening of ICT use in educational environments.
- Fast and efficient access to information by students or the research staff.
- Help for using the instrumentation or the device to characterize.
- Personalized guide for the performance of the activities and measures.

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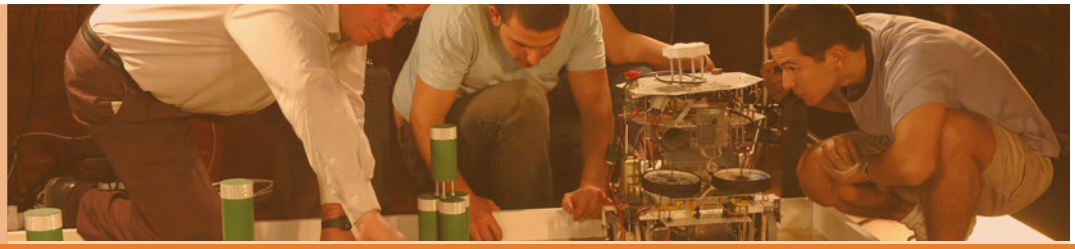

ARP-PATH SHORTEST PATH BRIDGES (FASTPATH ETHERNET TRANSPARENT BRIDGES)

TECHNOLOGY OFFER

Code

TIC_UAH_05

Application areas

- Information and Communication Technologies

Type of collaboration

- Interested in companies or institutions to conform a consortium for a project proposal to make it the system real
- License agreement
- Technical cooperation
- Joint venture agreement

Main researches

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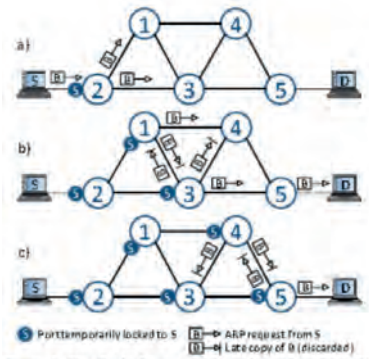

Figure 1. FastPath discovery from host S to host D

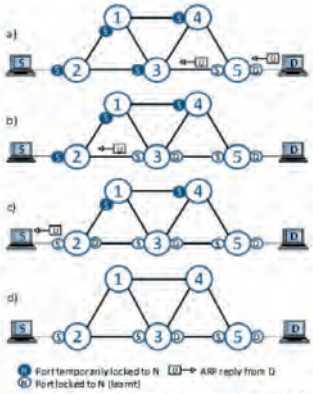

Figure 2. FastPath confirmation from host D to host S

ABSTRACT

Fastpath (also known as ARP-Path) is a radical departure from this approach. It is a natural evolution of the transparent bridge paradigm to implement near shortest path bridging (or strictly shortest, depending on the loop prevention mechanism). Instead of interchanging topology information, short unicast paths and source rooted multicast trees are built directly in the data plane without any ancillary routing protocol, just by controlled flooding (to bridges or to hosts) of an on demand or periodically broadcasted beacon frame. The fastest unicast path in transmission direction, among the paths permitted by the loop prevention mechanism, gets selected at every bridge. This path is then confirmed as a bidirectional, symmetric path, after reception of the unicast reply frame from the destination host or bridge(s). In this way, unicast paths and/or source rooted spanning trees are set up directly in the data plane.

The proposed FastpathUD protocol prevents loops by enforcing a simple and limited prohibition of some turns of frames at bridges (down-up turns only, around one fifth of the total possible turns), instead of the full link prohibition applied by the spanning tree protocol. Throughput is close to that of shortest path protocols. Alternative mechanisms for loop prevention may be used to attain full shortest paths performance.

The resulting architecture requires zero-configuration, uses standard Ethernet frame format, relies on standard Rapid Spanning Tree Protocol, is fully transparent to hosts with or without frame encapsulation, and compatible with 802.1D bridges in core island mode.

ADVANTAGES AND INNOVATIONS

PFastpathUD is the first proposal using for Layer two Shortest Path Bridging and unicast/multicast source rooted tree construction, without need of an additional (control plane) routing protocol and the simplest one.n switches.

- Provides very simple and performant Ethernet Shortest Path bridging devices Zero configuration. Compatible with IEEE 802.1D standard in core-island mode.
- Ethernet switches are used everywhere, but have severe limitations (blocking of many links by the spanning tree protocol to prevent loops, complex configuration).
- Ethernet Fastpath switches provide high network utilization and performance equal to Shortest Path Bridges (under standardization at 802.1aq), without the need of running complex link state protocols on switches.

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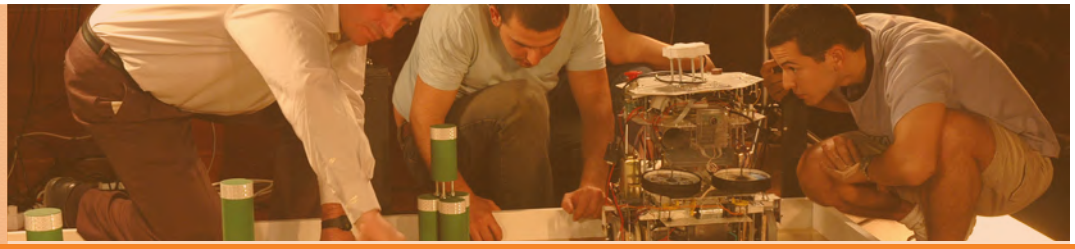

PROCEDURE TO REPAIR CLUSTERED ROADS IN FAILURE AND ARP-PATH/ALL-PATH NETWORK BRIDGE

Patent
ES2527550

Code

TIC_UAH_07

Application areas

- Information and Communication Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement

Main Researchers

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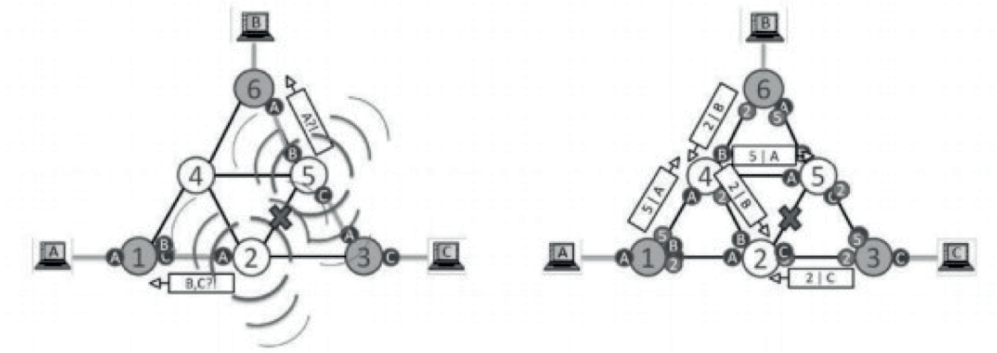

ABSTRACT

The main drawback of the path establishment protocols based on the instant scanning of the network, that are called Fast-Path, ARP-Path and generically All-Path, occurs when a link or bridge falls.
If that happens when the link is going to be used it is necessary to individually repair each existing path, which requires to spread a frame across the entire network (and process it especially on the bridges).
One of the ways that requires to be repaired. This is a significant process load for the bridges especially when the number of simultaneous active connections on a link is very high (1 Gbps or 10 Gbps).
The present invention achieves a group repair in the paths in fault. This repair is done in a jointly and proactively way. When the failure in the link is detected, it is sent with the joint repair plot of all (or part of) the terminals directions (hosts) associated with the output port link when it failed.
By mean of a broadcast message to the management of common multicast group to all the All-Path bridges and with an All-Path protocol identifier. The message is forwarded to all bridges in the network and then processed in each of the All-Path bridges. That process is responded issuing an unicast message from each bridge border of the terminal (host) for the direction or directions to repair.
This message is directed with destiny the intermediate bridge that originated the broadcast message and connected to the link in failure. The message goes through each bridge and produces the learning in that bridge the terminal direction destination. Thus repairing the road to destiny.
This unicast message may be a special Unicast Path Reply message or a standard ARP Reply message.

ADVANTAGES AND INNOVATIONS

The main innovative aspect of the patent is the clustered joint repair of all paths used by a link when it fails, which resolves the main limit scalability of the protocol.
It is computationally less expensive because of:

- Dramatically reduce the burden of repair messages broadcast on the network and the processing at intermediate switches.
- Not required to distribute across all network (and process together bridges).
- The repair is performed in a jointly way by destination switch and not individually.

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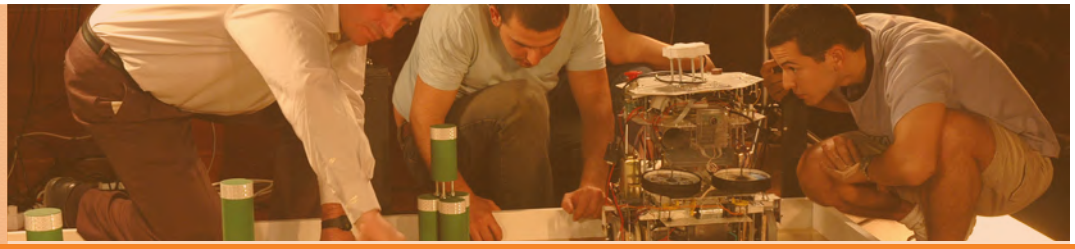

DIFFERENTIAL DETECTION SYSTEM OVER OPTICAL FIBER BASED ON BRILLOUIN STIMULATED SCATTERING

Patent
ES2528327

Code

TIC_UAH_09

Application areas

- Information and Communication Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement

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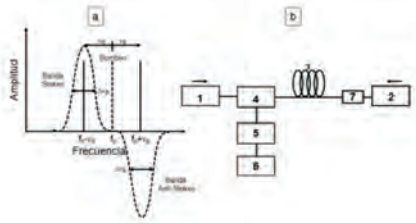

FIGURA 1

ABSTRACT

As a first aspect of the invention, a distributed sensing system is presented which comprises; light emitting means adapted to emit the probe and pump signals on the optical fiber, discriminating means adapted to separate the two signals corresponding to the amplified band and attenuated band along the optical fiber subject to monitoring, detection Means adapted to obtain the difference between band of amplification and stimulated attenuation band or viceversa and analyzing means, adapted to implement the distributed sensing technique based on Brillouin scattering using the differential measurement of amplification band and the attenuation stimulated band, instead of the measurement of a single band as in conventional systems.

Two preferred options for the discriminating means are:

- A device which discriminates in frequency.
- A device which discriminates in polarization.

Once separated the two signals (amplified band and attenuated band) so that they can be analyzed independently, two preferred detection means methods are:

- A device which discriminates in frequency.
- A device which discriminates in polarization.

As a second aspect of the invention, a distributed sensing method is shown consisting in separating the two signals corresponding to the amplified band and attenuated band along the optical fiber subject to be monitoring. Thus is obtained a signal with higher amplitude than in the case of performing a detection with a single band. With this increase in the amplitude the signal-to-noise ratio of the sensor signal is improved, improving the dynamic range and increasing the length scope and at the same time decreasing the uncertainty of the measurement.

The present invention solves the long-standing problems by means of the system and method of sensing which implements any of the techniques based on Brillouin stimulated scattering (systems BOTDA, BOCDA and BOFDA including their variants) by a differential detection of amplified and attenuated bands.

ADVANTAGES AND INNOVATIONS

- The sensor signal relationship between signals to noise is improved. Dynamic range and scope length increase as well as reduces the measurement uncertainty.
- The common noise presented in the two bands of the probe signal is eliminated.
- In the case of using a balanced detector for detection, the detector saturation characteristics are improved, and can be obtained with much larger amplitudes than in the conventional case of signal detection.

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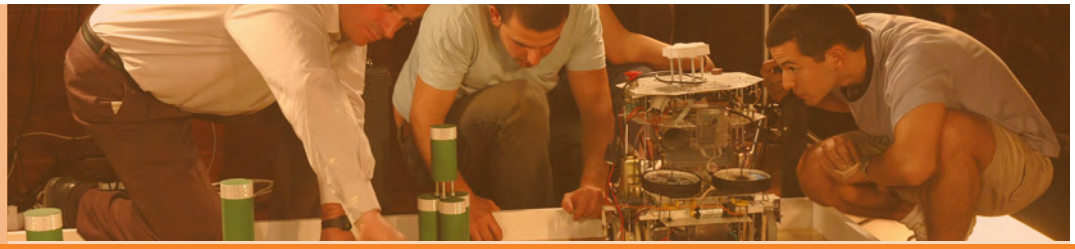

SYSTEM AND METHOD OF DISTRIBUTED CONTINUOUS CHARACTERIZATION OF AN OPTICAL FIBER MEDIA

Patent
ES2528327ES2561679B2

Code

TIC_UAH_10_P

Application areas

- Information and Communication Technologies
- Industrial Manufacture, Material and Transport technologies
- Energy

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement

Main Researchers

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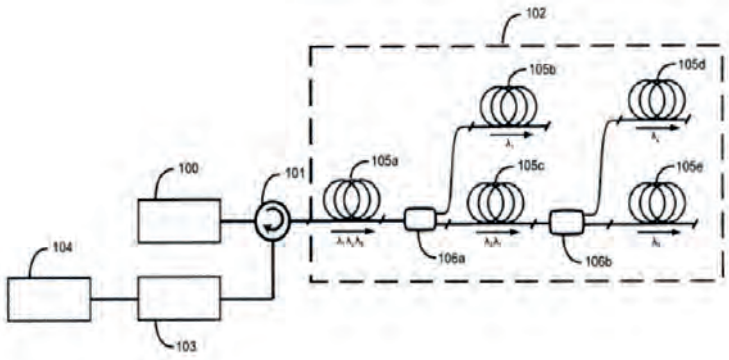

ABSTRACT

It is a system and a sensing method which allows the fully distributed characterization of optical fiber media with an arbitrary branching of ramifications using wavelength multiplexing techniques to interrogate and identify the different branches of such optical fiber media. As a first aspect of the invention, is presented a distributed characterization system with at least one branch in which there are two or more segments of optical fibers. As a second aspect of the invention, is presented a distributed characterization method applied to an optic fiber media, with at least one branch comprising at least two optical fiber segments.

In one of its preferential implementations, the method consists on characterize the optical fiber media by an optical reflectometry technique sensible to the phase (ϕOTDR).

ADVANTAGES AND INNOVATIONS

The system and the method of the present invention allow the characterization of optic fiber medias with an arbitrary topology branches without using measurement equip- ment in each ramification.

The competitive advantages of this invention are as follows: Application in complex networks with arbitrary branches without adding measuring equipment in each of the branches. Characterization fully distributed, providing decisive measures in length, continuous, and not sampled. Adaptation to any fiber optic topology, sensing techniques and distributed metrology.

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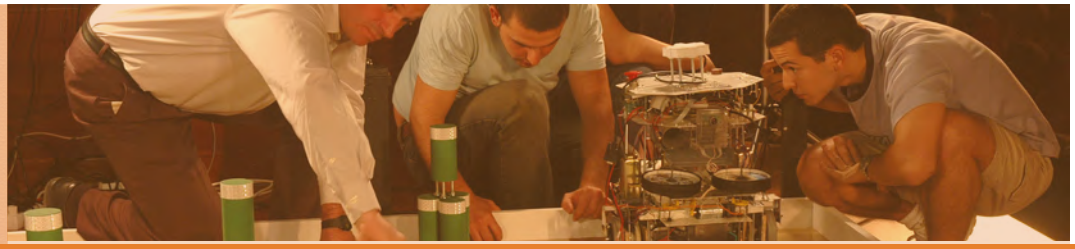

DEFINITION AND DESIGN OF EFFICIENT ARCHITECTURES FOR ADVANCED ELECTRONIC SYSTEMS

TECHNOLOGY OFFER

Code

TIC_UAH_11_C

Application areas

- Information and Communication Technologies
- Industrial Manufacture, Material and Transport technologies
- Other Industrial Technologies

Type of collaboration

- Acquisition Agreement
- Commercial Agency Agreement with cooperation

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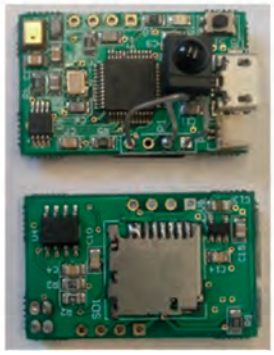

ABSTRACT

The GEINTRA research group from the Department of Electronics of the University of Alcala presents a wide experience in the definition and design of embedded electronic systems, with high complexity and requirements, for the implementation of efficient architectures in different fields of application: communications, transport, energy, control and power, sensory systems, etc.

This type of solutions, based on SoC (System-on-Chip), FPGA devices (Field-Programmable Gate Array) and/or processors, represent an effective alternative, with competitive advantages when dealing with high operation frequencies, demanding response times, complex experimental tests, safety approvals, etc.

ADVANTAGES AND INNOVATIONS

The GEINTRA group can proceed with the design of advanced architectures (including SoC) for the implementation of digital signal processing, control algorithms and any other application, which are analysed in detail to be able to deal with the definition of the most suitable proposal for its implementation in last generation devices. This type of development and expertise represents an important advance when it comes to developing successful solutions for the electronic product market, available to be incorporated into any application area where an electronic system for high-performance information processing is necessary, with possible mixed hardware/software solutions.

In most cases, the partner sought will be interested in know-how and transversal knowledge from the research group in the design of electronic systems, efficient architectures and SoCs, for its application in any of the fields already addressed in the group, as well as in new areas and domains, of interest to both parties. For this, a collaboration will be established within a specific legal framework, such as a research contract.

GEINTRA seeks to reach technical cooperation agreements with companies in the ICT and industrial sectors in general, but also particularly in areas such as communications, sensory and positioning systems or transportation.

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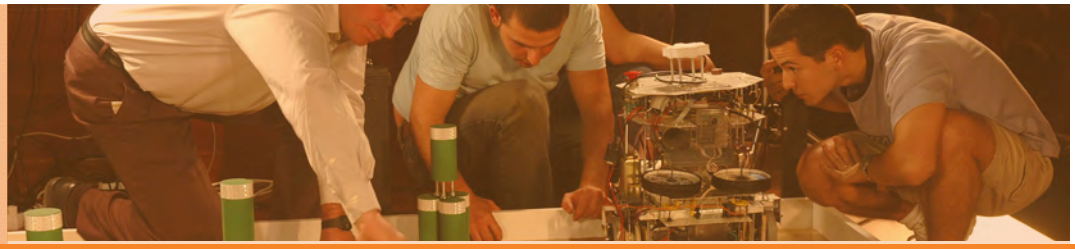

SIGNAL DEMODULATING DEVICES THROUGH A WAVELET OFDM RECEIVER

Patent
ES 256 148 B2

Code

TIC_UAH_14_P

Application areas

- Communications through the electrical network
- Smart grid
- Internet of things
- 5G

Type of Collaboration

- Technical cooperation
- Commercial agreement
- Technical assistance
- License agreement

Main Researchers

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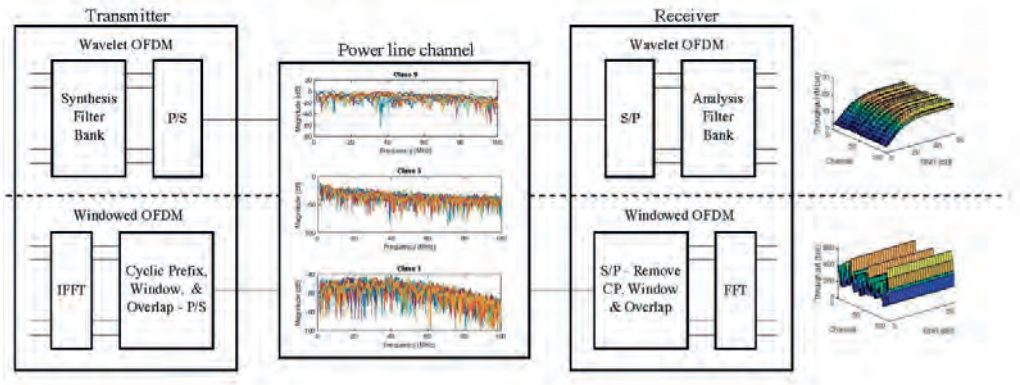

ABSTRACT

The invention proposes a receiving system for multicarrier signals modulated in the transmitter with wavelet OFDM. This receiver includes a frequency-domain equalizer that corrects the channel effects. The invention also proposes a fast algorithm of implementation, and can be used in all those systems that employ multicarrier modulation based on Wavelet OFDM. Furthermore, the invention presents the following innovative aspects:

- It is compatible with several standards of communications by the electric network.
- It presents greater spectral efficiency than windowed OFDM.
- It increases the robustness of the system, decreasing the probability of error.
- It allows to improve the data rate in very noisy hostile enviroments.

ADVANTAGES AND INNOVATIONS

Smart Grid (SG) and IoT will bring one of the biggest technological changes in the first half of the 21st century. Within the context of SG, IoT-oriented technologies and systems are experiencing outstanding growth (28.5% between 2016 and 2020), with a large number of social and economic sectors demanding / offering new products from / to the market.

This change must be based on communication technologies that provide SG and IoT with capacity, efficiency and reliability in the transmission of information. The communication by the electrical network, or power line communication (PLC), is well positioned to offer this service, since it exhibits advantages as:

- Cost reduction to deploy new infrastructure, since it uses the existing power lines cables, and
- Great capillarity, allowing access to all IoT entities and systems that have power from the electrical network.

Wavelet OFDM is the modulation technique proposed in standards for PLC broadband data transmission in in-home electrical network, on platforms, for Smart Grid, and for IoT devices.

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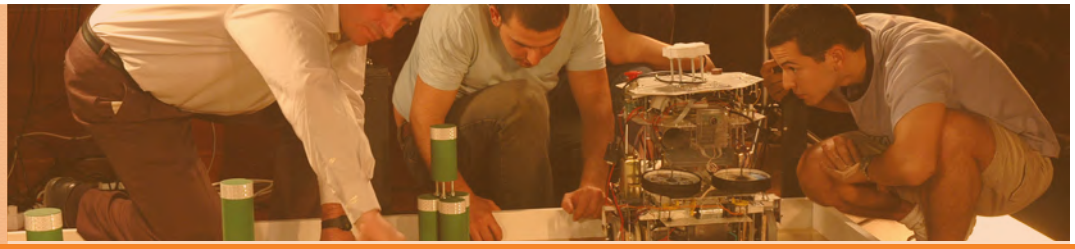

CATCHAPS/HIPS TO TEST AND IMPROVE THE SECURITY

TECHNOLOGY OFFER

Code

TIC_UAH_15

Application areas

- Information and Communication Technologies

Type of collaboration

- Interested in companies or institutions to conform a consortium for a project proposal to make it the system real
- Manufacturating Agreement
- Services Agreement

Main researches

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ABSTRACT

Extensive knowledge and experience in IT Security, in particular, in the field of the security of CAPTCHA/HIP. It has also performed several successful security analyses of very different CAPTCHAs/HIPs currently in production.

They can assist in:

- Developing a threat model covering their proposal. This would allow our customers to better understand the security ecosystem in which their proposal is working and better conduct Risk Management strategies.
- Assessing the security of their current CAPTCHA proposal or implementation. This would allow the customers to understand if their CAPTCHA/HIP proposal or implementation passes a minimum security level without which it should not be put into production.
- Study of improvements. This service is orientated towards allowing the customers to improve their CAPTCHA/HIP security without affecting much the user interaction. This study might or not reach an improvement, depending on the proposal. After the results of this study, a new security assessment should be run.
- Improvement of Resilience. This service would allow us to cooperate with our customers towards implementing additional measures to increase their CAPTCHA/HIP security under attack. This would possibly include attack detection and mitigation mechanisms.

ADVANTAGES AND INNOVATIONS

Having a secured CAPTCHA implementation can help a company to protect its on-line assets from various types of automated abuse. This can prevent the loss of revenue to the company, and also allow it to confidently offer more on-line services knowing that their automated abuse is difficult.

Innovative aspects:

- Automatic attacks to test the security of the implementation.
- Increase the security against external attacks

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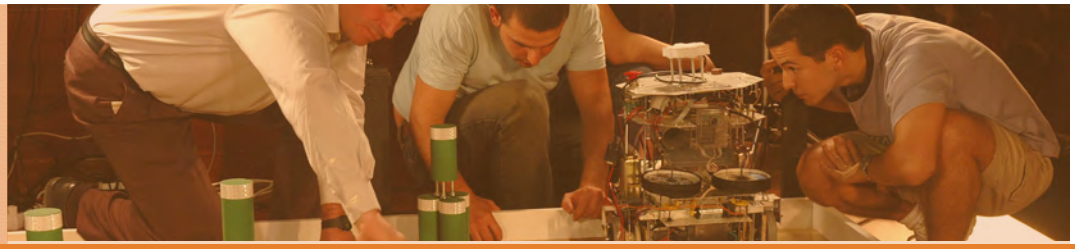

TCARE ROBOTIC SOLUTIONS FOR TELECARE

TECHNOLOGY OFFER

Code

TIC_UAH_16

Application areas

- Information and Communication Technologies

Type of collaboration

- Interested in companies or institutions to conform a consortium for a project proposal to make it the system real
- Manufacturating Agreement
- Services Agreement

Main researches

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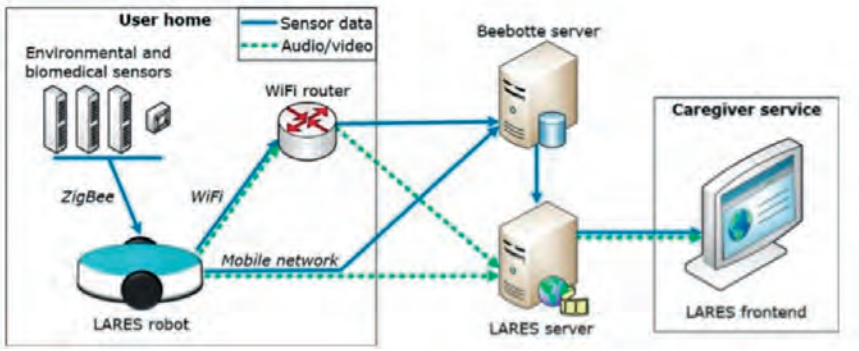

ABSTRACT

We propose a set of innovative tools for companies of telecare and medical assistance. These tools consist of three parts to achieve three objectives:

- Implement telepresence in patients' homes. With telepresence, caregivers can quickly contact with patients which means a significant reductions in travel expenses.
- Provide real-time alerts on the status of patients.
- Elaborate medical reports on the behavior of patients.

The three parts of the system are:

- An autonomous and telecontrolled robot that implements radio telepresence.
- A network of sensors to monitor the patient unobtrusively thus achieving the acquisition of important variables on the patient..

A web platform that allows caregivers to manage the system. By intelligence artificial, the web platform provides alarms and medical reports. In addition, caregivers can control the telepresence robot therefrom.

ADVANTAGES AND INNOVATIONS

So far, the solutions offered to dependent people consist of an emergency necklace button or an emergency phone button (with or without GPS). Both are active systems where the patient has an important role.
Our system presents a new alarm management for the benefit of patients and caregivers allowing a better market positioning, scalability in health care environments and reducing travel expenses.

- A new level of telecare 3.0 that implements e- health and telepresence databases.
- A robotic solution that implements telepresence
- A web platform as a tool for caregivers
- A passive rol of the patient in using the system
- An effective management of potential patient falls and alarms by monitoring with a sensor network WSN.

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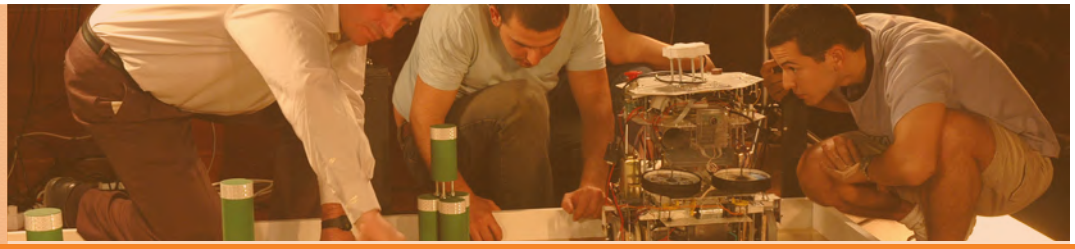

DISTRIBUTED CHARACTERIZATION SYSTEM AND METHOD OF VARIATIONS OF THE REFRACTIVE INDEX OF AN OPTICAL FIBER.

Patent
ES2622354

Code

TIC_UAH_17

Application areas

- Information and Communication Technologies
- Measurements and standards

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement

Main Researchers

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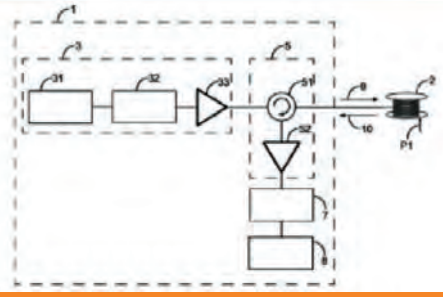

ABSTRACT

This invention proposes a system and a method for distributed measuring of local variations of refractive index between different states of an optical fiber, for comparison of amplitude profiles of Rayleigh scattering, generated in two different states of the fiber by two light pulses of snapshot frequency, variable in time and invariant between pulses. The system consists in:

- Emission media that generate optical pulses with a same profile of instantaneous frequency, being this frequency variable along a single pulse.
- Receiving media that receive the backscattered optical signals, connected to the same end of the fiber of the emission medias (by an optical circulator)
- Detection media that measure, at least, the amplitude profile of the backscattered optical signals.
- Computing media that calculate the local variations of refractive index, occurring between different states of the optical fiber.

The system further comprises, distributed expansion means that amplify the signal emitted into the optical fiber, allowing the characterization of longer lengths of fiber. The method consists in:

- Generate and transmit the optical signals described through a fiber under test.
  Receive the backscattered optical signals generated in the fiber at the same end of the fiber tan the transmission
- Measure the amplitude profiles of the backscattered optical signals, using a photodetector whose exit serves as an entrance to a digital mean, such as an oscilloscope.
- The method may include, the measuring of the amplitud and frequency profiles of the pulse optical signal or use some other stored.
  Calculate the local variations of refractive index of the fiber occurred between different states of the fiber.
- Computing media that calculate the local variations of refractive index, occurring between different states of the optical fiber.

With the system, method and computer program of the invention, a measure of the local variations of refractive index of the fiber, with high spatial resolution, high sensitivity and high speed is obtained.

ADVANTAGES AND INNOVATIONS

The invention provides a characterization of high spatial resolution, sensitivity and speed, requiring a single pulse to characterize a state of the optical fiber instead of using frequency sweeps in multiple pulses.
Limited number of elements and therefore reduced cost of the sensor system.

Universidad de Alcalá

MODE-LOCKED PULSED LASER USING SATURABLE ABSORBER

Patent
ES2622354

Code

TIC_UAH_19_P

Application areas

- Information and Communication Technologies
- Measurements and standards Environment and risk prevention
- Energy

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement

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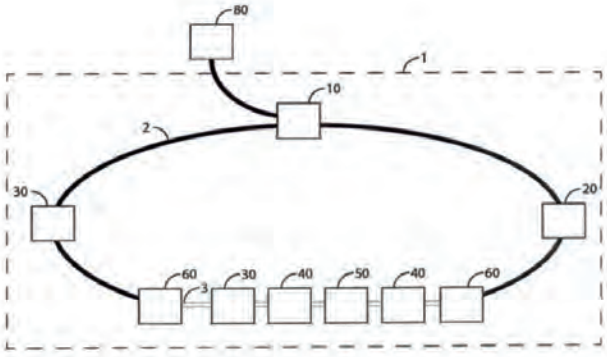


ABSTRACT

It is a mode-locked pulsed laser whose optical resonator comprises a saturable absorber based on nitrides of group III. The use of this type of materials as saturable absorber allows to achieve a high stability and emission energy without increasing the complexity of the system. A mode-locked pulsed laser based on a resonator with an optical gain medium and a saturable absorber, wherein the saturable absorbent comprises at least a nitride of group III. The nitride of group III is selected from one of the following subgroups, being able to comprise elements of several subgroups in order to configure the wavelength and emission power of the device. Binary compounds: gallium nitride (GaN), aluminum nitride (AIN) or indium nitride (InN). Ternary compounds of gallium nitride and indium nitride, such as InGaN. Ternary compounds of gallium nitride and aluminum nitride, for example AlGaN. Ternary compounds of aluminum nitride and indium nitride such as AlInN.Quaternary compounds of gallium nitride, aluminum nitride and indium nitride, for example AlInGaN.

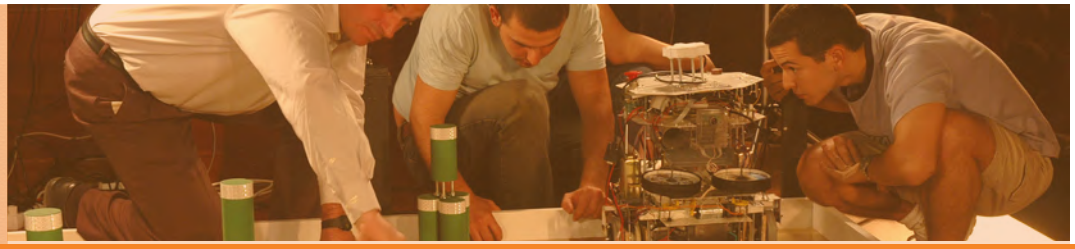
ADVANTAGES AND INNOVATIONS

This is a completely new use of nitrides of group III, Particularly related to the development of lasers, it introduces as saturable absorbers, materials composed of nitrides of group III, that allow to reach a high stability and emission energy without increasing the complexity of the system. Nothing similar has been found in patent databases or in the scientific literature consulted.

The mode-locked laser provides high peak power, energy per pulse, stability, and oper- ating range. It also allows operation independently of the polarization, simplifying the design and control of the device.

Development with reasonable costs and possibility of distribution in the international market: USA, Europe and Japan.

The group seeks for companies in the ICT, health and industrial sector or any company that manufactures mode-locked laser based on fiber optic, to sign technical cooperation agreements, commercial agreements with technical assistance or patent licensing agreements.



INTERACTIVE PLANT CELL : EDUCATIONAL ROBOTICS PROJECT

Patent
ES1167808U

Code

TIC_UAH_20

Application areas

- Biological Sciences
- Other Industrial Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement
- Interested in companies or institutions to conform a consortium for a project proposal to make it the system real.

Main Researchers

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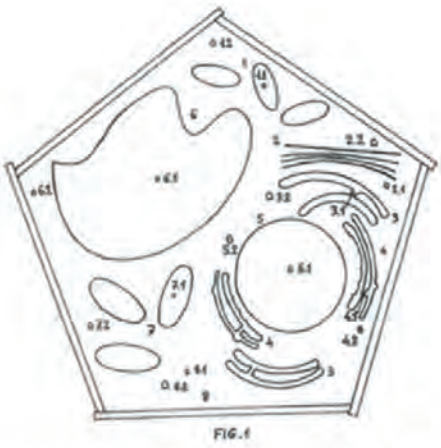

FIG.1

Figura 1: Muestra la composición de la maqueta didáctica interactiva con las piezas armadas mostrando la estructura de la célula vegetal con sus orgánulos. (1) Mitocondria; (2) Aparato de Golgi; (3) Retículo endoplasmático liso; (4) Retículo endoplasmático rugoso; (5) Núcleo; (6) Vacuola; (7) Cloroplasto.; (8) Estructura pentagonal verde.

ABSTRACT

The present invention proposes the creation of an interactive and buildable didactic mock- up. This model can be used in both primary and secondary education.
The mock-up comprises the base of the cell and on the outside the cell walls. The base of the model comprises hollow spaces corresponding to the organelles of the plant cell they represent, including the mitochondria module, the chloroplast module, the nucleus module, the smooth endoplasmic reticulum module, the reticulum module Rough endoplasmic, the vacuole module and the Golgi apparatus module.

To allow a comfortable use of the model and that is easily manipulate, the pieces that conform it fit in their corresponding holes. In this way the user can separate, press and manipulate the parts that interest him at any time without having to disassemble the complete set. Thanks to its three-dimensional shape, the didactic model facilitates the compression of the structure of the plant cell.

In addition, the present invention provides the physical contact necessary to improve the assimilation of concepts and to understand the structure of a plant cell in a simple and affordable way at the cognitive level of the user.

ADVANTAGES AND INNOVATIONS

The combination of the 3D printing of the cell and the interactive robotic parts, becomes a novelty in the market.

- Nothing similar has been found in the scientific literature consulted.
- Nothing similar has been found in a report full search.

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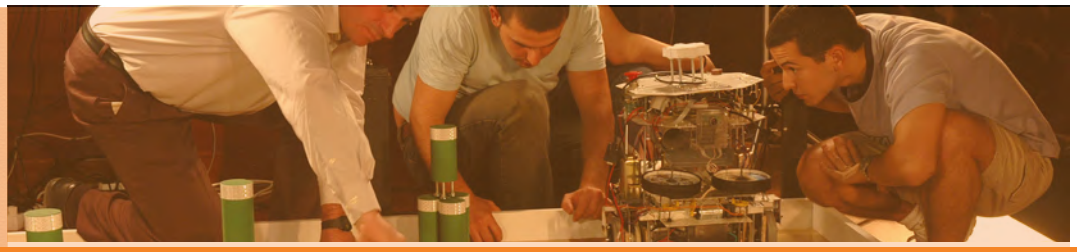

NOVEL SYNCHRONIZATION PROCESS FOR MULTI-CARRIER OR SINGLE-CARRIER COMMUNICATIONS

Patent
ES 2639 05

Code

TIC_UAH_21

Application areas

- Information and Communication Technologies

Type of Collaboration

- Technical cooperation
- Commercial Agreement
- Commercial agreement and Technical assistance

License agreement

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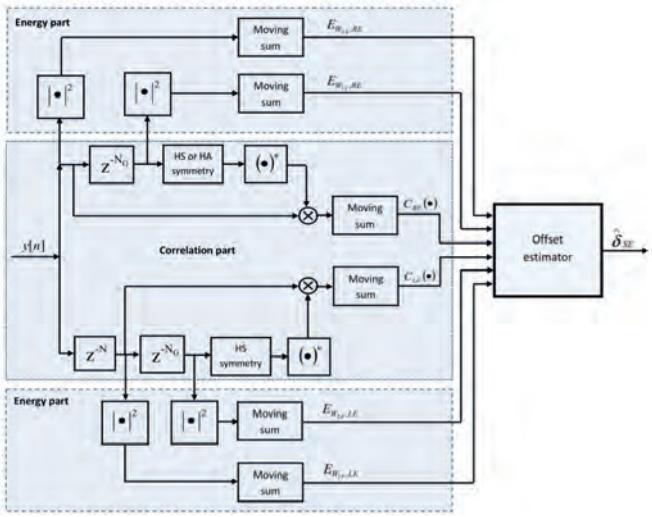

ABSTRACT

This invention presents a novel synchronization procedure for multicarrier or single carrier systems for narrowband and broadband communications. This procedure allows a precise estimation of the Symbol Timing Offset (STO), and an approximation of the carrier frequency offset. The procedure is based on the inclusion of symmetric extensions in the transmitted symbols for the synchronization, which makes it useful not only for communications systems based on the discrete Fourier transform (OFDM and windowed OFDM), but also for transceivers based on discrete cosine transform (FAST-OFDM).

Among its main applications are communications through single-mode optical fiber, power network, wireless, and in general, all the techniques that use multicarrier and carrier modulation.

ADVANTAGES AND INNOVATIONS

In any multicarrier or single carrier modulation system, symbol timing estimators play an important role in the receiver to find the start of the symbol of the received signal. The invention proposes a method for synchronization in a multi-carrier or single carrier modulation point-to-point or multipoint transmission system, in which the symbols transmitted to the other equipment have symmetrical extension.
The new technique is based on the fact that the correlation between two signals provides a quantitative measure of their similarity.

The proposed technique perform well, especially in low dispersive channels.
It is proven that considering the BER and the probability of the estimate error in the time ofset, a performance gain over conventional techniques is obtained when the length of the redundancy increases.

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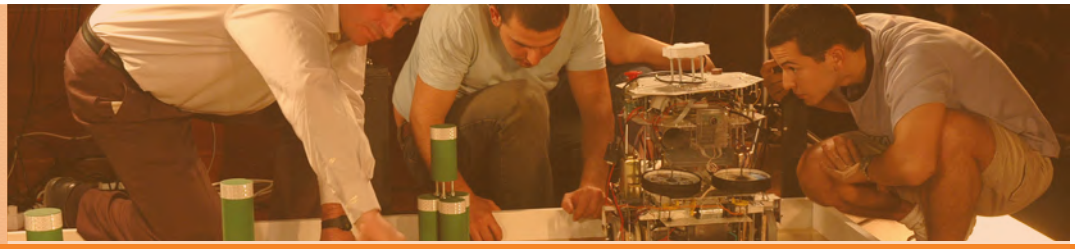

SYSTEM OF INTELLIGENT PROBES OF MONITORING APPLIED TO OBJECTS OF DAILY USE, FOR THE DETECTION OF NEURODEGENERATIVE DISEASES OR DEVIATIONS IN THE TYPICAL DEVELOPMENT OF A PERSON

Patent
ES2663417 A1

Code

TIC_UAH_23

Application areas

- Information and Communication Technologies
- Industrial Manufacture, Material and Transport technologies
- Biological Sciences and Health Measurements and standards

Type of Collaboration

- License Agreement
- Commercial Agreement
- Commercial agreement and Technical assistance

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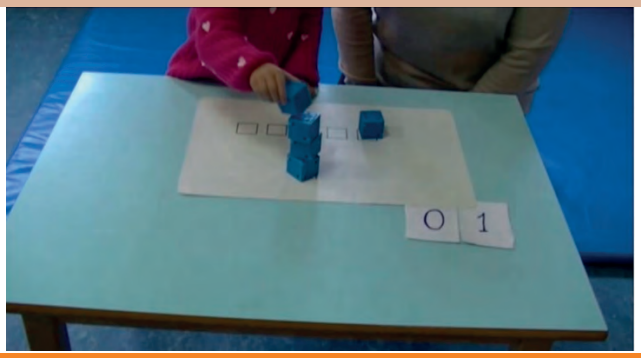

ABSTRACT

The present invention defines a data capture and data analysis system that parameterizes the way of using objects of daily use (cups, spoons or toys) in order to detect possible cognitive or psychomotor difficulties in people, after analyzing the data monitored.
It consists of one or several probes where some sensors and a collector are coupled. The probe consists of a microcontroller, a wireless communication device, a motion sensor and connectors able to integrate sensors (light, force). The collector receives infotmation from the sensors and sends it to a storage system (database), through a network, for later analysis. The analysis system retrieves the information from the storage system to analyze it by applying techniques of data analysis and artificial intelligence, obtaining a diagnosis about the activity of the person analyzed.
Here are some examples of applicability:

- Integration of the probe into a cup to know the movement patterns when using it, with the aim of detecting possible neurodegenerative diseases. For example, to measure the increase of tremors in people with Parkinson's disease or other diseases that have cognitive impairment.
- Integration of the probe inside a ball to analyze the form and intensity that is hit or thrown by a person, through parameters such as maximum acceleration, maximum speed or turns.
- Set of beakers in which a probe is inserted in each one of them that measures the time that a person takes to make a tower of them and the way he/she moves them.

For children under 1-year-old, a probe can be integrated into the rattle to measure movement patterns and the force with which it is gripped.

ADVANTAGES AND INNOVATIONS

- The probe incorporates emitters of light and sound.
- The system can be calibrated so that it can be applied both to the detection of patterns of fine and gross psychomotor movements.
- It performs exact measurements besides the capture of variables of greater use.
- The databases generated by the storage system allow to compare different tests between them and to study the possible changes or evolutions.
- The activities can be managed from a user interface that runs on a smartphone, tablet or computer that communicates wirelessly with the collector.
- The person who manages the activity may add additional information to the interface, such as the identifier of the person performing the activity.
- Information is analyzed using techniques of data analysis and artificial intelligence.

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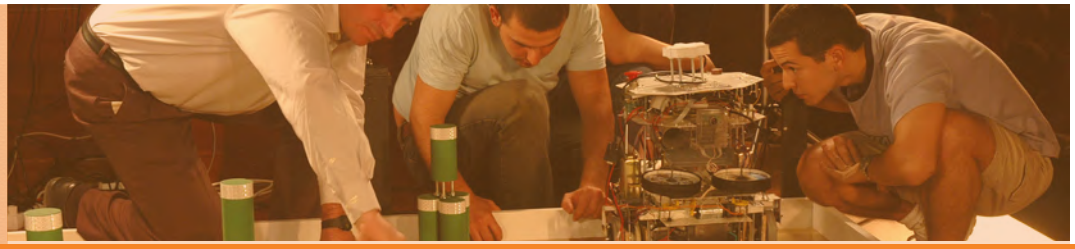

PROCEDURE OF STABLISHMENT, ERASING OF PATHS AND FORWARDING FRAMES FOR TCP TRANSPORT CONECTIONS AND NETWORK BRIDGE

Patent
ES2540595

Code

TIC_UAH_25

Application areas

- Information and Communication Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement

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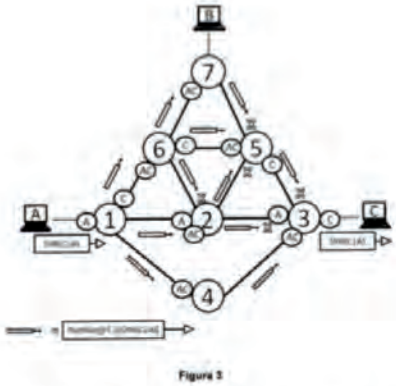

Figura 3: Muestra la búsqueda de un camino TCP-Path tras la recepción de un segmento de transporte TCP con SYN activado (Path Request)

ABSTRACT

The Telematic Services Engineering research group of the University of Alcalá, in collaboration with IMDEA NETWORKS, has developed a mechanism for advanced TCP-Path Ethernet switches that explores a network of transparent bridges to establish a specific path for each new TCP connection established between two terminals. The main applications of this Ethernet switch technology are networks of data centers and com- puter networks in general, audio-video bridges and other types of transparent Ethernet bridges.

The group is looking for companies in the telecommunications sector with the aim of reaching technical collaboration agreements, commercial agreements or patent licenses.

ADVANTAGES AND INNOVATIONS

This invention allows the paths between terminals to be established with TCP connection granularity: one path per connection, improving the distribution of load in the network. Roads are not needed to be calculated, they are obtained by exploration in the network, finding the path less loaded at each moment.

In addition, the path establishment, path clearing and frame forwarding mechanisms described can be implemented in a network bridge that has the corresponding tables to associate the ports to tuples formed by MAC address pairs and origin and destination transport ports. They can also be implemented in bridges with OpenFlow and SDN (Software Defined Networking) capability.

The TCP-Path model can create as many additional paths as transport connections exist at any time.

It presents commercial potential at an international level, focused mainly on the markets of the US, Europe, Australia and Japan with reasonable difficulty and cost of implementation.

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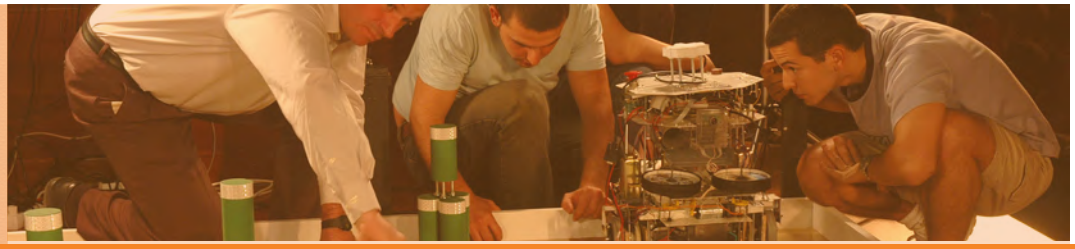

ESTABLISHMENT, REPAIR AND DELATING PROCEDURE OF DISJOINT MULTIPLE PATHS, REDIRECTION OF FRAMES AND NETWORK BRIDGE. MULTIPLE DISJOINT PATHS (MDP).

Patent
ES-2638292

Code

TIC_UAH_27

Application areas

- Information and Communication Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement

Main Researchers

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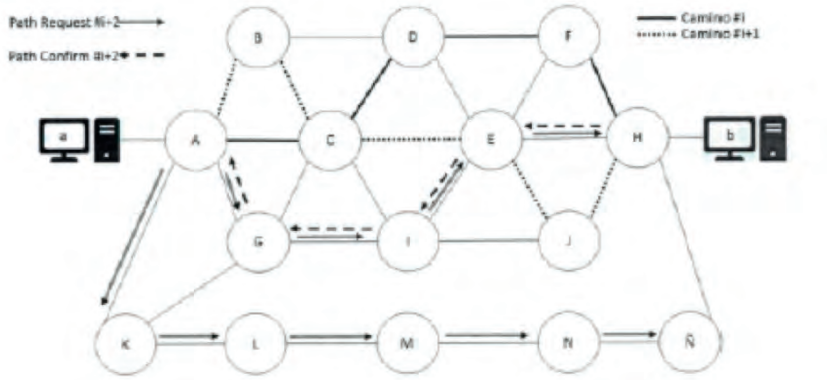

ABSTRACT

This invention describes mechanisms that sequentially and completely explore a network of transparent bridges to discover and establish multiple bidirectional paths, disjointed in links only or disjointed in nodes and links, between pairs of bridges bordering the network, as well as a network bridge that implements these mechanisms.

The origin frontier bridge sends multicast road establishment packages to the destination bridge, that propagate until reaching the destination bridge, which confirms to the frontier bridge each disjunct road establishment by means of a message from destination to origin, that leaves identified and established the bidirectional path in each bridge.

The roads are automatically deleted when a certain time passes without confirmation, without being used or when sending the border bridge an explicit delete packet of a road or all roads. The number of created paths is parameterizable and both ends communicate to each other the number of output links available, in order to know the maximum number of disjoint paths feasible.

These multiple disjoint paths created by border bridges can be used by an entity or protocol for load sharing, reliability enhancement or other purposes.

The present technology has special application for Ethernet switches for enterprise networks and data centers.

ADVANTAGES AND INNOVATIONS

Unlike Shortest Path Bridging, Multiple Disjoint Paths does not require knowledge of the topology or any calculation against the extremely complex SPB (multiple symmetric minimum paths between nodes, to calculate disjoint routes in the network graph). In MDP, the selected paths are the fastest of the disjoint ones, so they are chosen according to the load, contrary to Shortest Path Bridging, which calculates them without having the real load in mind.

Unlike the protocols derived from AODV and DSR, MDP performs the automatic discarding, without inspection, of the many packages with redundant routes that arrive at the bridges.

The main advantages of this technology are simplicity, scalability and adaptation to real network traffic by selecting the fastest routes, without route calculations.

The protocol can also be used to establish multiple paths between terminals if desired, increasing the state stored in the switches.

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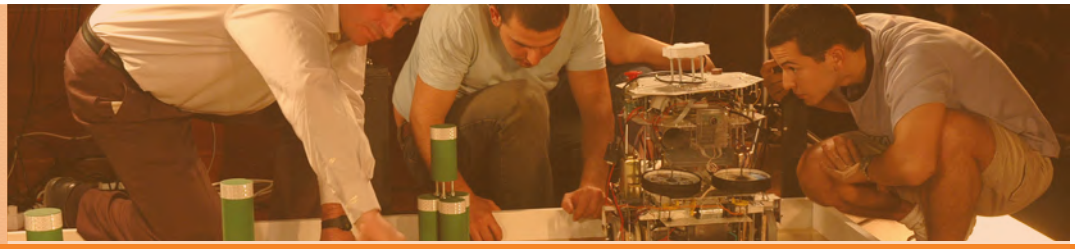

COOPERATIVE PROCEDURE SDN-REPAIR NETWORK FOR FAULTY PATHS AND NETWORK BRIDGE

Patent
ES2647665B2

Code

TIC_UAH_28

Application areas

- Information and Communication Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement

Main Researchers

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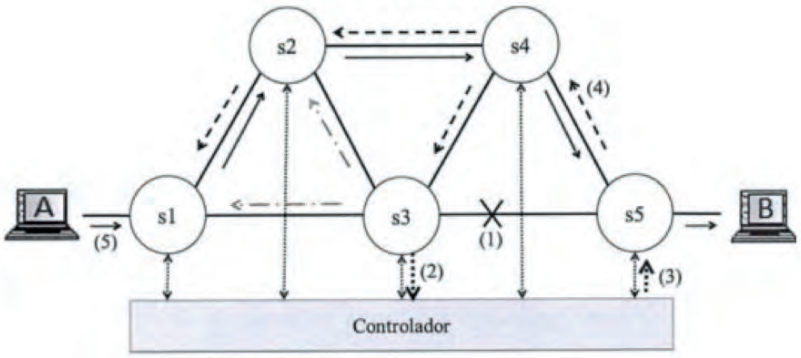

ABSTRACT

The present invention describes mechanisms that allow, in a network of transparent bridges with OpenFlow interface and equipped with learning functionality of paths with temporary blocking of the ARP-Path relearning, implementing the repair, in cooperation with the SDN controller, of all the paths in use that go through a certain link when it fails.

In this way, when a link or other cause fails to repair a path to a bridge terminal, it informs the controller by sending an OpenFlow packet of type Packet-In containing the destination address to be repaired.

The controller queries in a table the frontier bridge to which each terminal is connected and sends an OpenFlow Packet-Out packet to the frontier bridge connected to the destination terminal. This package contains a multicast repair frame that the bridge deencapsulates and sends through all its links, flooding it until reaching the bridge that detected the failure of the link, and establishing this frame as it passes through the network, a confluence tree where it can reach to the bridge of the destination terminal, whose branches, one or more, will be used by the frames in transit to the destination.

These mechanisms can be implemented in specialized hardware devices or partially or totally as software programs executed in specialized as well as generic hardware devices. Its most important application is in switches for Networks defined by software.

ADVANTAGES AND INNOVATIONS

The combination between the functionality of a bridge with OpenFlow interface to controller, and a semi-autonomous ARP-Path bridge on the same bridge, has the advantage of being able to avoid the need for the controller to control all the data flows of the network, by delegating on the bridges the function of basic forwarding of frames in layer two of the flows that are not explicitly controlled by the OpenFlow controller.

The reconfiguration of paths before failure is slow and complex both in pure SDN networks with central controller for its complete centralization, and also in ARP-Path bridge networks distributed by their extreme distribution.

This invention combines the advantages of having a central controller, with those of conducting a direct and distributed path exploration by the network from the destination bridge.

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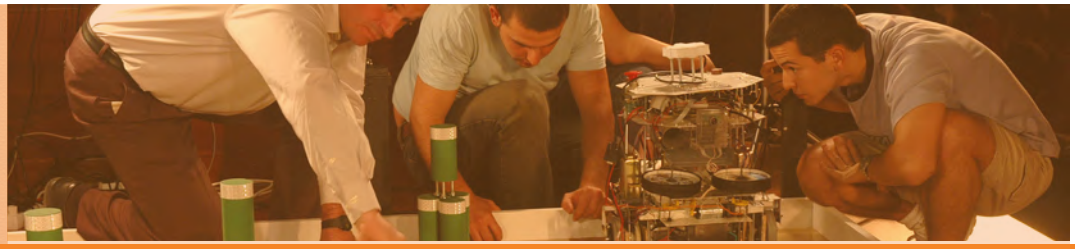

SYSTEM AND METHOD OF DISTRIBUTED CHARACTERIZATION OF DISPERSION PROFILE OF AN OPTICAL FIBER

Patent
ES2596260B1

Code

TIC_UAH_30

Application areas

- Information and Communication Technologies
- Industrial Manufacture, Material and Transport technologies
- Energy

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement

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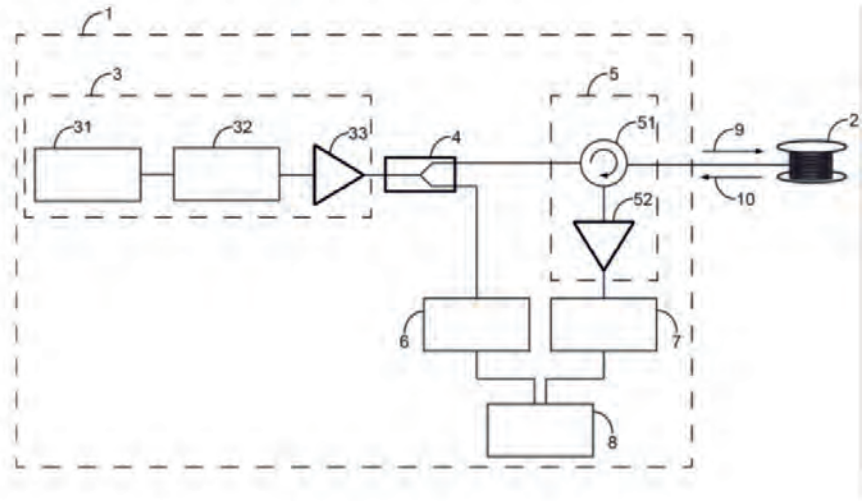

ABSTRACT

It is a system and method of distributed characterization of optical fibers that provides an absolute measurement of the dispersion profile of the fiber. The present invention is applied to the field of telecommunications and, in particular, to the industrial area of sensing and distributed characterization of optical fibers. Comprises a system, a method and a computer program for the distributed characterization of optical fibers that provides an absolute measure of the dispersion profile (scattering) of the fiber, by comparing the phase and amplitude of a pulsed light and of the Rayleigh scattering generated by that pulsed light, being the Rayleigh scattering measured through, at least, a differential photonic detector.

ADVANTAGES AND INNOVATIONS

With the system, method and computer program of the invention, an absolute dispersion profile of high resolution and high sensitivity is provided. The measurement range is limited only by the intensity of the pulsed light, allowing the incorporation of distributed amplification systems. Additionally, the optical fiber under test is characterized in an absolute and continuous way, without comparing multiple states, and the results can be provided in real time. Distributed fiber optic characterization technique capable of measuring the absolute dispersion profile in a long sensing range with high spatial and temporal resolution. It takes into account the phase and amplitude of the signal and not only the intensity of the scattered signal. The optical fiber under test is characterized in an absolute and continuous way, without comparing multiple states and the results can therefore be provided in real time.

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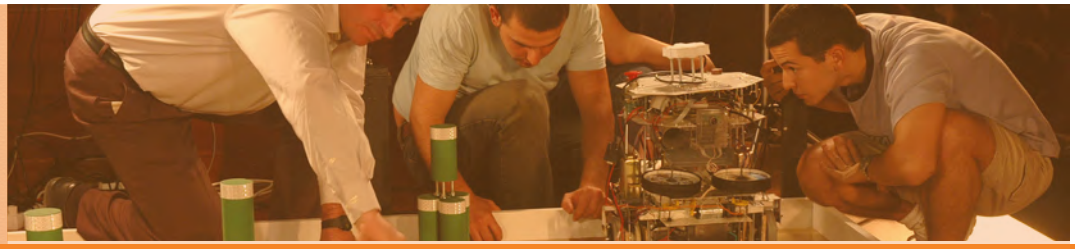

ADAPTATION OF A LEARNING PLATFORM TO THE PERSONAL NEEDS OF THE STUDENT. IMPROVEMENT OF THE ACCESSIBILITY IN ONLINE EDUCATION.

Patent
ES2681918

Code

TIC_UAH_31

Application areas

- Information and Communication Technologies
- Socioeconomics
- Education

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement

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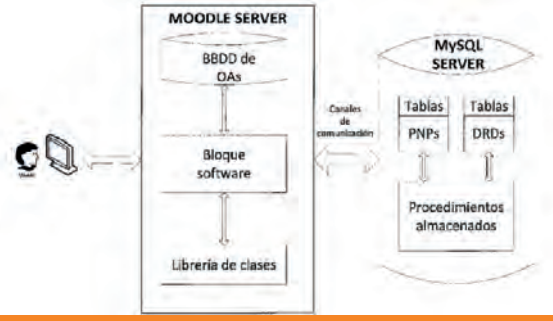

ABSTRACT

This invention relates to a method for adapting a learning platform to the personal needs of students. This is a procedure for adapting the Moodle learning platform through which students with vision and/or hearing problems can introduce a personal profile of accessibility that allows the system to identify the problem. When the student selects a specific educational resource, the adaptations belonging to this resource that suit his/her personal needs are shown. In addition, teachers are authorized to publish adapted material associated with original content (video, subtitles, audio description or sign language).
Parallel to this resource, another one runs in background: the refresh of the web cache of the student's computer with those resources adapted to their personal needs that have been updated by the teacher and that have a high probability of being selected by the student in their next actions. The server 1 governs the execution of the procedure, supports the reading of the personal needs that the student introduces and the loading of the learning targets by the teacher, harbor the database of learning targets and their adaptations, establishes the channels of communication necessary for the exchange of information between the servers and manages the refreshing of the web cache on the student's computer. The software installed on server 1 has been mostly designed independently of Moodle technology, allowing its reuse and system scalability. Server 2 supports databases of students' personal needs and digital resources, making them portable to any other system, being this, the main reason why an exclusive server has been used for this purpose.

ADVANTAGES AND INNOVATIONS

The learning platform has been adapted following the latest version of the IMS AccessForAll version 3.0 standard, that provides greater facilities of use of the application. The data models have been reduced considerably, allowing a greater understanding of students and teachers. It allows the student to select more than one value in the metadata value spaces, creating a profile more adjusted to reality.
It offers the possibility of generating student profiles automatically. In case of manual creation of profiles, the tool fills in automatically the most of the accessibility metadata based on the basic metadata entered by the student. The system performs an efficient search and visualization and/or download of the adaptations that meet the student's profile (previous articles do not show this phase of adaptation). Two MySQL databases have been introduced that not only efficiently manage profiles and digital resources, but also allow them to communicate with other systems such as repositories and other learning platforms thanks to the chosen technology and the software implemented.

- Simplicity of data models
- Possibility of extensions to new types of functional diversity Possibility of communication with other applications
- Saving the waiting time by downloading the learning objects, since they were pre- viously downloaded in parallel with other tasks.

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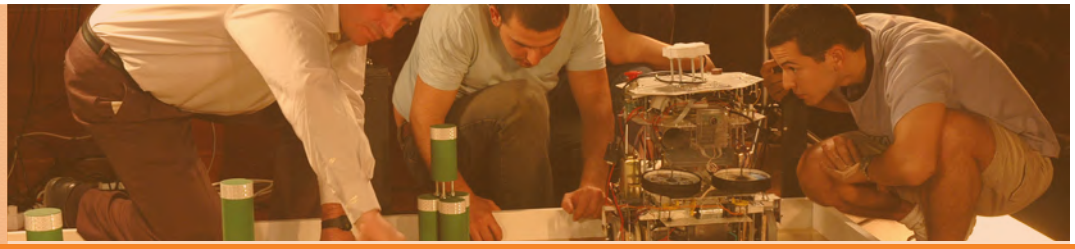

SYSTEM FOR IMPROVING ACCESSIBILITY IN LEARNING PLATFORMS BY USING PUSH BUTTONS FOR PEOPLE WITH MOTOR DISABILITIES

Patent
ES2684592

Code

TIC_UAH_32

Application areas

- Information and Communication Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement

Main Researchers

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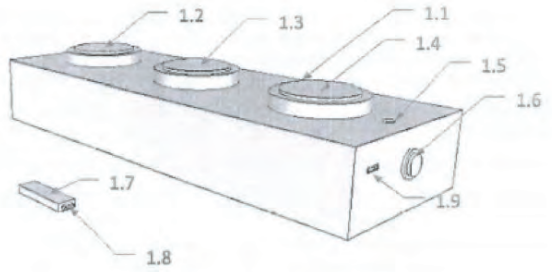

Aspecto externo del sistema de pulsadores

ABSTRACT

This invention provide a technical solution for the improvement of accessibility in online education.
At present, students with mobility problems can't access the teaching material published on the learning platforms, due to their inability to move the computer mouse and/or conventional keyboards.
The present invention therefore relates to a hardware and software system, ergonomic and adapted to the needs of people with reduced motor functional capacity, consisting of the creation and control of a scanning applied to a learning platform, which allows them to access to the information provided by a learning platform through a push button sys- tem.
The adapter receives the information from the push buttons and adapts it to the computer interface. The software part generates an automatic or manual scanning managed by the pushbuttons, whose speed and sound are configurable.
This system provides students access to the menu offered by the platform, allowing them to reach the information by using two different types of virtual buttons or push buttons:

- Virtual buttons: they appear on the computer screen and offer the settings of the scanning speed and the activation or deactivation of the sound.
- The physical buttons form the access adapted to the ergonomics of the student since they can be easily pressed.

ADVANTAGES AND INNOVATIONS

- Creation and control of a scanning applied to a learning platform.
- Joint action of a system of push buttons for interaction with the computer in the learning platforms and the possibility of adaptation for any application. Web for people with disabilities of motor origin.
  The system offers the possibility of executing the scanning in automatic or manual mode.
- It uses large ergonomic push-buttons so that they can be used by people who present a high level of difficulty in the movement of hands or upper extremities.
- It implements energy saving by automatically detecting the ambient light level and conveniently switching the buttons off or on. In addition, the way of working of the microcontroller entails an energy saving to maintain usually in sleep, waking up periodically for the tasks completion.
- The cost of the final development and the subsequent commercial exploitation will be low.

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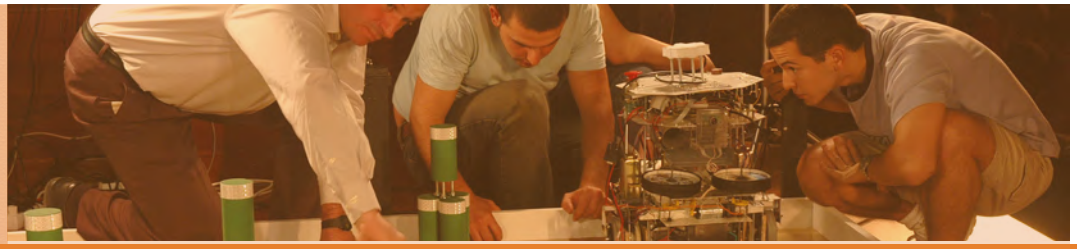

EFFICIENT SENSING TECHNIQUES FOR SMART CITY APPLICATIONS

TECHNOLOGY OFFER

Code

TIC_UAH_33

Application areas

- Information and Communication Technologies

Type of collaboration

- Interested in companies or institutions to conform a consortium for a project proposal to make it the system real
- Manufacturating Agreement
- Services Agreement

Main researches

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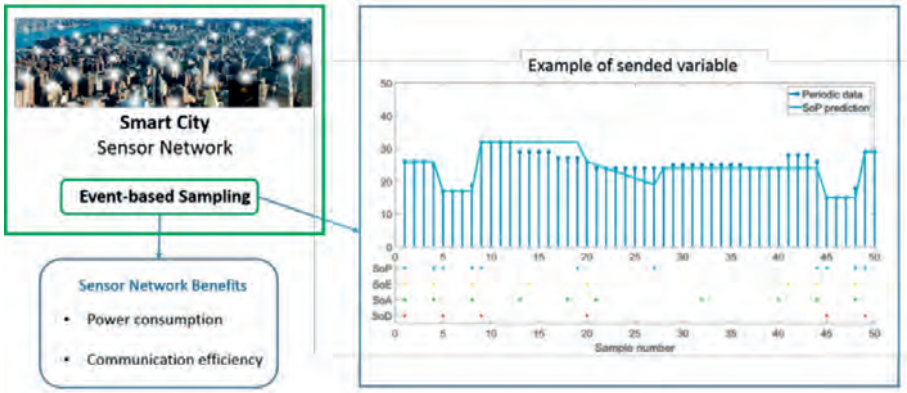

ABSTRACT

The city of the 21st century demands a set of digital services that provide citizens with improved access to resources such as transport, education, health care, energy, safety and the environment. Giving intelligence to these services means having an extensive network of sensors and the management of information supported by the Internet of things (IoT). Wireless sensor networks present two major challenges: efficient communication and energy autonomy. Event-based sensing techniques help to optimise both by analysing the information registered in the sensor and making it available to the network only when necessary. In the GEINTRA group we have experience in event-based sensing techniques and their application to the field of Smart Cities.

ADVANTAGES AND INNOVATIONS

Compared to classic techniques of network periodic sensing, wired or wireless, this technology offer has the following advantages:

- Adaptation of the decision strategy of when to measure and, above all, when to transmit the information to the processing central node.
- Extension of the average battery life powering the sensory node and therefore the node life.
- Optimization of the massive use of the communication network allowing the link between sensory nodes and these with the processing central node.
- Selection of the most appropriate event-based estimation technique, taking into account trigger thresholds and maximum waiting times.
- Modelling the sensed variable behavior to evaluate the triggering mechanism implementation outside the sensorial node itself.
- Integration of event-based sensing techniques with available IoT solutions and cloud processing.

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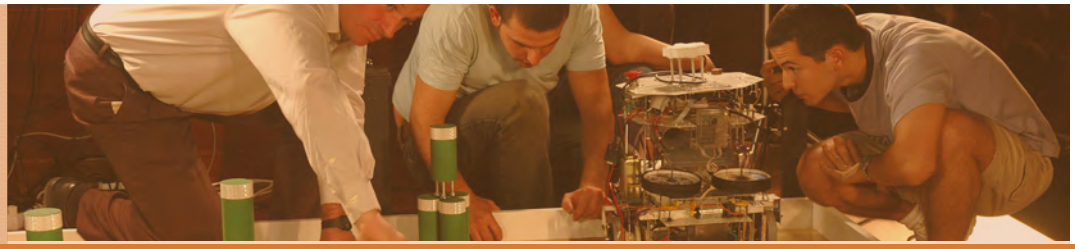

INTELLIGENT SYSTEM FOR AUTONOMOUS CONTROL IN ROBOTICS COOPERATION

TECHNOLOGY OFFER

Code

TIC_UAH_34

Application areas

- Information and Communication Technologies

Type of collaboration

- Subcontracting
- Manufacturating Agreement
- Services Agreement

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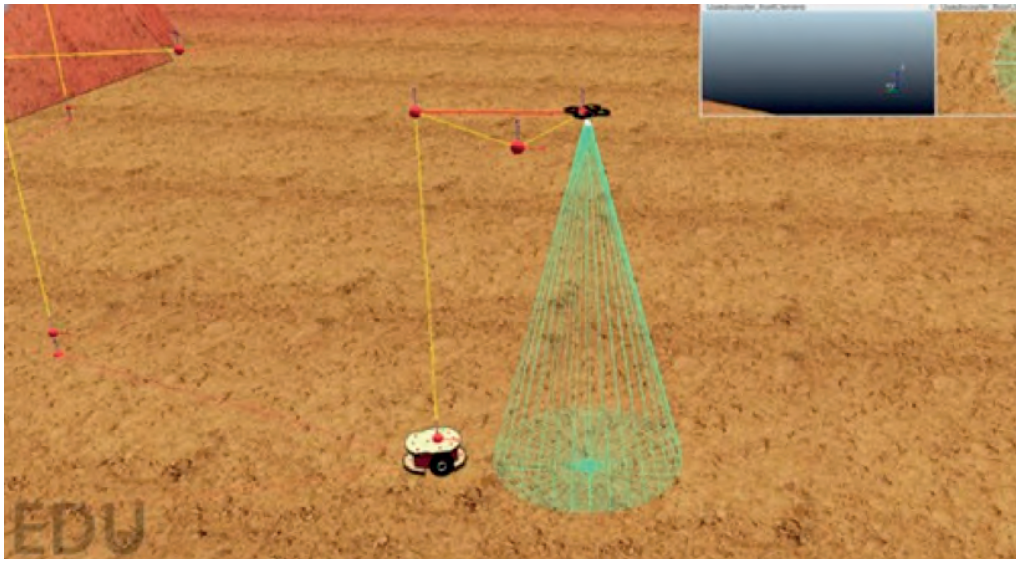

ABSTRACT

Over the last decade, there has been a strong scientific and industrial concern in robotic cooperation. From problems of surveillance in industrial, commercial or domestic environments, or rescue and help in catastrophic areas, till problems of efficient package delivery in companies like Amazon or DHL, require mathematical optimization algorithms that solve these problems optimally and efficiently through the deployment of cooperative robot teams.

The cooperatTive ExploRation Routing Algorithm (TERRA) is a planning system that, using artificial intelligence techniques, allows a team of robots to combine their capabilities to complete more complex tasks. For this, TERRA implements a novel robotic cooperation paradigm that offers a solution to the problems mentioned in the previous paragraph. This exploration paradigm uses a ground vehicle to reach terrestrial targets and, a drone team to reach the aerial targets.

Unlike other route planners, TERRA coordinates and plans efficient routes that meet the objectives set in the shortest time with the greatest cost savings.

ADVANTAGES AND INNOVATIONS

- Autonomous and heterogeneous robotic cooperation
- Routing and tasking optimization
- Multi-objective optimization
- Intelligent, efficient and robust explorations

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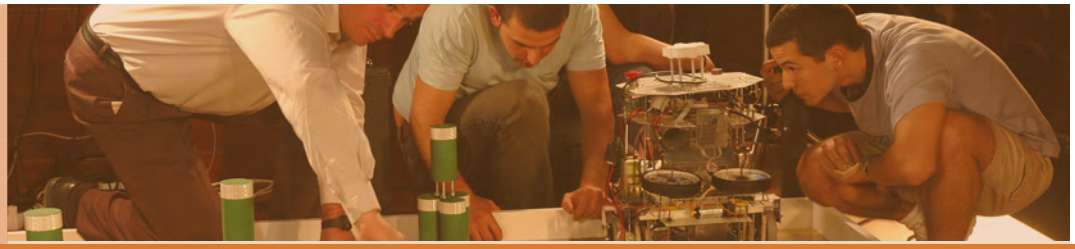

SYSTEMS AND APPLICATIONS BASED ON INDOOR POSITIONING VIA LED-LIGHTING

TECHNOLOGY OFFER

Code

TIC_UAH_35

Application areas

- Information and Communication
- Technologies
- Indoor positioning system
- Positioning Real Time System
- Infrared localization
- Embedded sensors

Type of collaboration

- Interested in companies or institutions to conform a consortium for a project proposal to make it the system real
- Manufacturating Agreement

Main researches

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ABSTRACT

The general objective is to obtain an indoor positioning system that is capable of estimating the position of "smart" devices or of simple detectors designed for that purpose (receivers) from the emission of codes embedded in the lighting light of a room / building. The achievement of this system shall allow the development of multiple applications for the set-up of routes and help guiding. The use of LED lamps available for lighting of different parts of a building or room in such a way as to allow the transmission of very high frequency codes non-perceptible by humans together with the illumination lights. These codes (one unique code for each LED lamp) will be decoded by light detectors included in smart-devices, or by detectors designed particularly for this purpose. From the code information, the device positioning can be determined with high precision.

ADVANTAGES AND INNOVATIONS

The accurate indoor position determination from lighting opens up a wide range of possibilities. The system could be applied in very different fields and applications such as museums, shopping centers, supermarkets, logistic warehouses, etc

- In museums, by means of the use of mobile devices, flexible routes can be traced depending on the available time to do the visit, a specific interest or even the type of user, in such a way that when the smart device captures the position it can show on the screen where the visitor is located and guide him/her to the next item to be visited. Additionally, if a picture or object is reached, the system could auto- matically download its information.

- In shopping malls, given the precision in the indoor location the system might provide people with routes to the desired shops.

- In supermarkets, the list of products to be searched could be introduced in the smartphone and it would guide the user, positioning itself by means of lighting, along the optimal route until all products are picked up.

- In logistic warehouses the same device used for picking&pack plus a simple detector based on photodiodes, might offer the operators the quickest route for the collection of multiple products.

- In hospitals and health centers, by means of mobile devices or simple detectors, it would be possible to know the location of medical personnel, wheel-chairs, equipment, etc.

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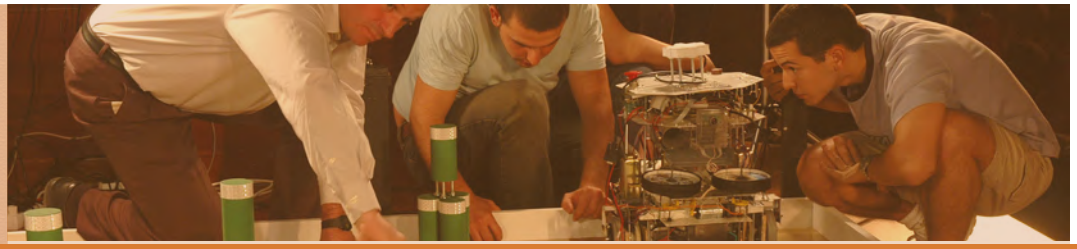

SEQUENCEPRO19: SOFTWARE FOR THE ANALYSIS OF DNA AND PROTEINS

TECHNOLOGY OFFER

Code

TIC_UAH_36

Application areas

- Information and Communication Technologies
- Biological Sciences.

Type of collaboration

- Acquisition Agreement
- Commercial Agency Agreement
- Distribution Services Agreement

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ABSTRACT

SeQuencePro19 performs about 115 different functions in a single application. It includes programs for editing, quantification and analysis of nucleotides or amino acids; translate reading frames and analyses amino acids; simulates restriction with enzymes, generates oligonucleotides (primers) for PCR, concatenates and aligns sequences and calculates molecular weights. Analyses sequence polymorphisms by RFLP simulation and design differential primers between ortholog sequences. The application generates databases to store the results. It also, make graphs that favour the interpretation of results; for example circular or linear restriction maps.

It is an application with a careful and clear design that, compared to others, is efficient. The access to all its functions is through buttons located on the screens of the applications and there are no menus and submenus. It is an easy-to-use and intuitive application. The user familiarizes with the program in minutes. SeQuencePro19 has applications that allows the user to manage several sequences simultaneously, which facilitates all the comparative analysis.

SeQuencePro19 creates its own files, but allows the inclusion of sequences from text or sequencing files (*.Seq) and also allows to paste nucleotide or amino acid sequences copied from any application or website.

ADVANTAGES AND INNOVATIONS

The set of applications included in SeQuencePro19 prevents the user from having to handle different applications from a variety of web pages, which facilitates his bioinformatic work of sequence analysis. The application works in Spanish or English, which can facilitate either its use or distribution.

Part of its power is based on the simplicity of its interface: the functions are accessed through buttons on the screens and not through menus and submenus. It is an open application that allows the incorporation of specific analysis software that may be required by researchers or scientific laboratories.

SequencePro19 contains some innovative bioinformatics applications, of possible biomedical use, whose algorithms have been originally described in scientific publications.