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專利技術名稱

外接無線電子式按壓響應系統

EXTERNAL WIRELESS ELECTRONIC PRESS-RESPONSE SYSTEM

Patent No：(R.O.C. 優先) I881867
專利權人： 郭詩坪 / CUO, SHY-PIN
發明人：郭詩坪 / CUO, SHY-PIN

快樂動-血液透析照護的好朋友!


洗腎握球訓練


互動遊戲-節奏練習

專利技術介紹：

本專利（產品名稱：快樂動）是一項結合智慧感測與健康照護的創新專利技術，專為復健、長照與醫療應用設計，特別針對洗腎患者動靜脈 管保養訓練提供全新解決方案。系統以外接式壓力感測主機結合慣性量測單元（IMU）與可替換氣嘴軟球，透過藍牙連線至行動 App，即時偵測按壓力道、時間、節奏與手部運動軌跡，並以語音與視覺回饋引導使用者正確操作。

傳統握球運動雖為維持血流暢通與預防 管阻塞的關鍵訓練，但因缺乏監測與回饋機制，患者常因操作單調或力道不當而難以持續。本系統導入智慧語音提醒、自動紀錄與雲端追蹤功能，可即時提示握力強度與訓練時間，協助患者在家中安全進行有效復健，同時讓醫療人員能遠端掌握訓練成果。

系統採模組化設計，具高擴充性與兼容性，可結合互動遊戲與節奏化訓練模組，以遊戲化操作提升患者參與度與持續動機。除洗腎應用外，亦可延伸至手部復健、感覺統合訓練及居家健康促進，實現臨床照護與日常保健的智慧整合，為高齡化社會提供兼具科技創新與人文關懷的健康解決方案。

Patented technology introduction:

The invention is an innovative patented technology integrating smart sensing with health care, designed for rehabilitation, long-term care, and medical applications—especially for hemodialysis patients' arteriovenous fistula maintenance. The system combines an external pressure-sensing unit with an inertial measurement unit (IMU) and interchangeable airball, connecting via Bluetooth to a mobile app that detects pressing force, duration, rhythm, and hand motion trajectory in real time, with audio-visual feedback for proper training guidance.

Traditional ball-squeezing exercises are essential for maintaining blood flow but lack monitoring and motivation. This system features smart voice prompts, automatic recording, and cloud tracking, helping users train safely at home while enabling remote progress monitoring by healthcare providers.

With its modular, expandable, and compatible design, the system can integrate interactive games and rhythm-based training to boost engagement and motivation, extending from dialysis care to hand rehabilitation and home wellness—offering an intelligent, human-centered health solution for an aging society.

勝行科技有限公司 / Sheng-Shing Science Co. Ltd.

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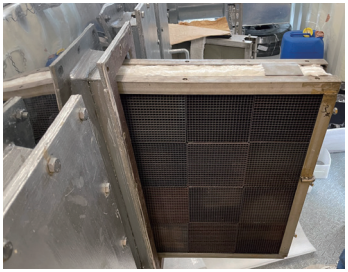
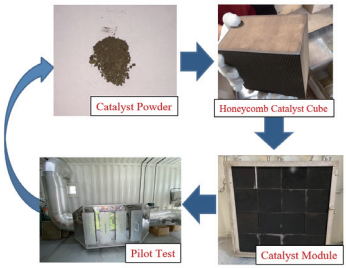
專利技術名稱

多孔脫硝觸媒的製備方法

Preparation method of porous denitration catalyst

Patent No：(R.O.C. 優先) I823162
專利權人： 台灣電力股份有限公司 / Taiwan Power Company
發明人：曾志富、郭麗雯 / TSENG, CHIH-FU、KUO, LI-WEN





專利技術介紹：

透過本專利技術製備「低溫型」SCR(Selective Catalyst Reduction) 脫硝觸媒，可應用於工業排放廢氣中氮氧化物 (NOx) 淨化處理。相較於高溫觸媒，具有較長觸媒壽命及應用領域廣的優勢。本發明技術以共沉澱法合成錳 (Mn)、鐵 (Fe) 及鈰 (Ce) 金屬氧化物所組成低溫觸媒，再利用塗覆或押出成型進行塑型，最後利用熱處理方式將觸媒活化。本發明技術僅需低溫 (<105℃) 及單一個熱處理裝置即可完成觸媒活化，可有效減少設備及能耗投資成本。同時，觸媒在 120~200℃低溫區具有極佳的脫硝效果，市場上極具競爭優勢。本專利技術目前已完成授權予相關業者，主要推廣應用於工程施工機具的柴油引擎中，如：挖土機、打樁機、推土機…等。

Patented technology introduction:

This patented technology makes a low-temperature SCR (Selective Catalytic Reduction) catalyst that helps clean up nitrogen oxides (NOx) from industrial exhaust. Compared with high-temperature catalysts, it lasts longer and can be used in a wider range of applications. The process uses a co-precipitation method to create a low-temperature catalyst made from manganese (Mn), iron (Fe), and cerium (Ce) oxides. It is then shaped by coating or extrusion, and finally activated through heat treatment. What’ s special is that the activation can be done at temperatures below 105° C using just one heating device, which saves a lot on equipment and energy costs. The catalyst also works really well in the low-temperature range of 120–200° C, giving it a strong competitive edge in the market. This technology has already been licensed to industry partners and is mainly being used in diesel engines for construction equipment like excavators, pile drivers, and bulldozers.

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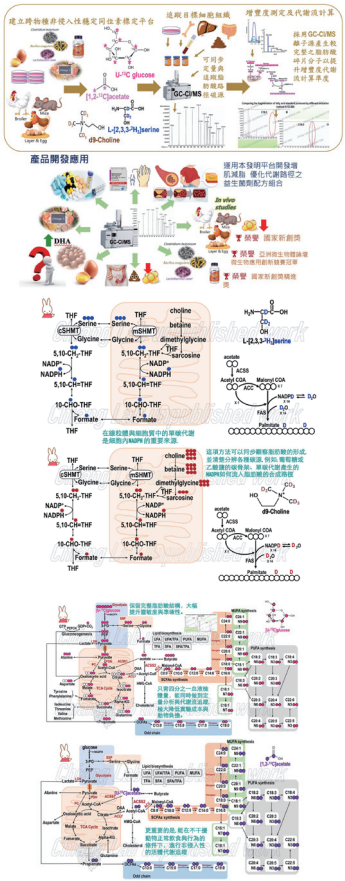
專利技術名稱

利用 GC-CI/MS 平台非侵入性同步定量及追蹤體內脂肪酸合成碳源路徑之分析方法

Non-invasive analytic method for simultaneously quantifying and tracing metabolic fluxes in fatty acid syntheses in vivo by GC-CI/MS system

Patent No：(R.O.C. 優先) I759783
專利權人： 國立中興大學 / National Chung Hsing University
發明人：蔣恩沛、蘇雅麗、黃羽萱、陳佳郁、周奕秀、黃介辰 / Chiang, En-Pei Isabel; Sou, Nga-Lai; Huang, Yu-Hsuan; Chen, Chia-Yu; Chou, Yi-Hsiu; Huang, Chieh-Chen.



專利技術介紹：

團隊開發出全球首創之非侵入性分析平台，可同步定量並追蹤體內脂肪酸合成的碳源路徑。此技術結合化學電離氣相質譜（GC-CI/MS）與多重穩定同位素追蹤，不僅保留較完整脂肪酸結構以提升靈敏度與準確性，還能透過天然同位素分布與代謝流增豐度計算出不同碳源對脂肪酸生成的貢獻。以 [U-^{13}C]glucose、[U-^{13}C]acetate、L-[2,3,3-$^{2}H_3$]serine 與 [trimethyl-d_9]-choline 為追蹤劑，揭示糖解作用、乙醯輔酶 A 與單碳代謝對脂肪酸與 NADPH 生合成之路徑貢獻，並證實來自細胞質與粒線體單碳代謝的 NADPH 在肝臟中主要用於不飽和脂肪酸合成。平台特色包括：非侵入性動物模式、不干擾飲食行為、可同時進行定量與碳源追蹤，並顯著降低樣品、藥品及儀器使用量。此技術為脂質代謝研究及減脂增肌配方開發的重要里程碑，由此技術衍生出的研究生果榮獲多項國內外殊榮，並技術轉移予台灣松詠與長瑩生技，並與長瑩生技共同開發出 CM1 LBP 配方，榮獲東京天才發明獎，展現學研轉譯與產業創新的典範。

Patented technology introduction:

The team has developed a non-invasive analytical platform capable of simultaneously quantifying and tracing in vivo carbon flux in fatty acid synthesis. This innovative technology integrates gas chromatography–chemical ionization mass spectrometry (GC-CI/MS) with multiple stable isotope tracers, preserving intact fatty acid structures to enhance analytical sensitivity and accuracy. By analyzing natural isotope distributions and metabolic flux enrichments, it determines the relative contribution of diverse carbon sources to fatty acid biosynthesis. Using [U-^{13}C]glucose, [U-^{13}C]acetate, L-[2,3,3-$^{2}H_3$]serine, and [trimethyl-d_9]-choline, the system uncovered how glycolysis, acetyl-CoA, and one-carbon metabolism contribute to fatty acid and NADPH production. Remarkably, it revealed for the first time that NADPH derived from cytosolic and mitochondrial one-carbon metabolism is preferentially used for unsaturated fatty acid synthesis in the liver. Featuring non-invasive animal models and simultaneous quantification and flux tracing, this platform reduces sample, reagent, and instrument demands. It provides a key tool for lipid metabolism research and for developing fat-reducing and muscle-enhancing formulations. The technology has been transferred to SongYung Biotech and TWBio Biotech for joint commercialization, leading to CM1 LBP—winner of the Tokyo Genius Invention Award and multiple international honors.

國立中興大學 / National Chung Hsing University

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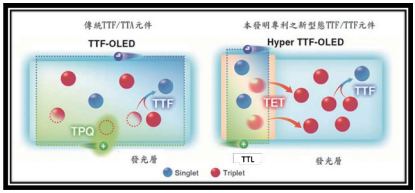
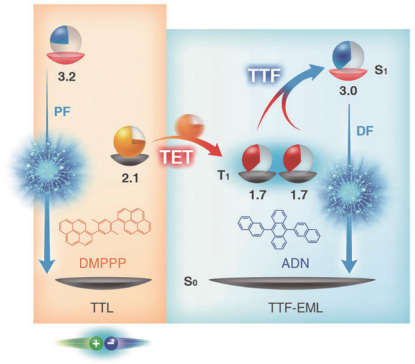
專利技術名稱

含芘基團之有機電激發光材料以及有機發光二極體

ORGANIC ELECTROLUMINESCENT MATERIALS CONTAINING PYRENE GROUP AND ORGANIC LIGHT-EMITTING DIODES USING THE SAME

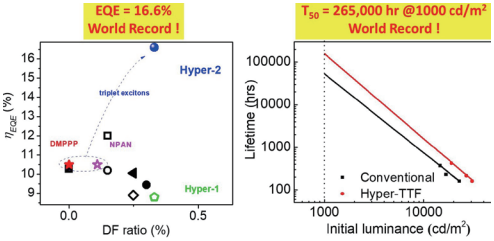
Patent No：(R.O.C. 優先) I875115
專利權人：元智大學；晶宜科技股份有限公司 / YUAN ZE UNIV; TETRAHEDRON TECH CORP
發明人：邱天隆、梁文傑、陳佳勳、朱宸君、張琦琦、黃怡茹、李君浩、 黃廉鈞、 蘇子文、莊元箴、黃靖翔 / CHIU, TIEN LUNG, LEUNG, MAN KIT, CHEN, CHIA HSUN, CHU, CHEN CHUM, CHANG, CHI CHI, HAUNG, YI RU, LEE, JIUN HAW, HUANG, LIAN CHUN, SU, ZI WEN, ZUANG, YUAN ZHEN, HUANG, JING XIANG





專利技術介紹：

超三重態三重態激子融合螢光放光機制發光機制為本實驗室所獨創之螢光有機發光二極體元件之機制。Hyper-TTFOLED 是一種改善傳統 TTFOLED 的新型結構，目前已有多家知名國際大廠使用此技術用於顯示器中。此專利技術特色為在原本單一發光層 EML 之外，額外加入了一層稱為 TTL 的材料層，來分隔載子重新結合區與 TTF 發光區。這樣設計可減少三重態與電載子的作用，提升三重態的利用效率與整體量子效率。另外有機發光層的材料選擇除了能階的匹配之外，還需要具有高熱裂解溫度，以避免高溫而產生熱裂解，進而導致穩定度下降。本發明提出一種具有優良的螢光量子效應與熱穩定性之含芘基團之有機電激發光材料以及其作為 TTL 層之有機發光二極體元件，具有優良的螢光量子效應與熱穩定性。



Patented technology introduction:

The Hyper-TTF fluorescence emission mechanism is a proprietary technology developed by our laboratory for fluorescent OLEDs. This mechanism is gaining recognition in research and industry, with granted patents including ROC Patent Nos. I699919 and I708827, and US Patent Nos. US 10,784,458 and US 10,700,303. Many leading international manufacturers now utilize this technique in displays.

Hyper-TTF OLEDs improve upon conventional TTF OLEDs by uniquely adding a Triplet Tank Layer (TTL) adjacent to the single Emissive Layer (EML). This design spatially separates the charge carrier recombination zone from the TTF emission zone. The separation effectively minimizes Triplet-Polaron Quenching (TPQ), significantly boosting triplet exciton utilization efficiency and the device's overall quantum efficiency.

Core materials for fluorescent OLEDs often include Anthracene- and Pyrene-based compounds. In addition to energy level matching, materials must possess high thermal decomposition temperatures for device stability. This invention presents a novel pyrene-group-containing organic electroluminescent material, suitable for use as the TTL layer, which demonstrates excellent fluorescence quantum efficiency and superior thermal stability.

元智大學 / YUAN ZE UNIV

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專利技術名稱

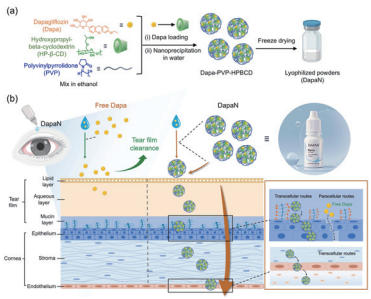
奈米眼藥水及其製造方法

Nano Ophthalmic Eye Drops and Methods of Manufacture

Patent No：(R.O.C. 優先) I756547
專利權人： 高雄榮民總醫院 / Kaohsiung Veterans General Hospital
發明人：鄭珮姣、陳瑛瑛、曾清俊、顏峰霖 / CHENG PEI WEN, CHEN YING YING, TSENG CHING JIUNN, YEN FENG LIN

專利技術介紹：

臨床上，糖尿病白內障缺乏可延緩 / 預防的局部藥物，患者多被迫等待手術；術後仍可能惡化為視網膜病變與新生血管青光眼，嚴重者甚至因劇痛而摘除眼球，家庭照護與醫療成本沉重（圖 1）。DapaN 為全球首創將 SGLT2 抑制劑 Dapagliflozin 奈米化之眼用點滴（100–170 nm），突破角膜直抵達水晶體，調控 SGLT2–AKR1B1–RAGE–EMT 並降低氧化壓力。動物實證每日一次、單次藥效達 12 小時，延緩病程且無眼毒（圖 2-3）。製程採水相微胞＋凍乾技術，粒徑穩定、批間一致、可 GMP 放大與常溫配銷，並可直接灌裝市售 PP 滴瓶。已獲台灣發明專利並規劃 PCT 佈局，平台亦可延伸至糖尿病視網膜病變與乾眼產品線具組合價值。DapaN 以「安全、非侵入、可量產」的創新模式，為全球逾五億糖尿病族群開啓照護新解方，讓手術不再是唯一選擇。



Patented technology introduction:

Clinically, no approved topical therapy can prevent or slow diabetic cataract, leaving patients to wait for surgery; postoperative worsening to diabetic retinopathy or neovascular glaucoma—and, in severe painful cases, eye enucleation—creates heavy family and healthcare burdens (Figure 1).

This invention presents DapaN, a first-in-class nano eye-drop platform that formulates the SGLT2 inhibitor dapagliflozin into stable polymer/cyclodextrin micelles (~100–170 nm). The composition overcomes corneal/tear barriers, prolongs ocular residence, and targets the lens while modulating SGLT2–AKR1B1–RAGE–EMT pathways and reducing oxidative stress (Figure 2-3). Preclinical data show once-daily dosing with ~12-hour effect and no ocular toxicity.

Manufacturing is fully aqueous (micellization with solvent exchange) followed by lyophilization, yielding batch-consistent particle size, rapid reconstitution, GMP scalability, room-temperature distribution, and compatibility with standard PP dropper bottles. Granted Taiwan IP (PCT planned). As a platform, DapaN supports mono- or combo-products and extension to other ocular indications (e.g., diabetic retinopathy, dry eye).

Result: a safe, non-invasive, and manufacturable solution. We seek co-development and tech-transfer partners to advance first-in-human studies—so that surgery is no longer the only option.

高雄榮民總醫院 / Kaohsiung Veterans General Hospital

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專利技術名稱

段木搬運機

Multi-Axis Log Handling Machine

Patent No：(R.O.C. 優先) I863763
專利權人：農業部林業及自然保育署 / Forestry and Nature Conservation Agency, Ministry of Agriculture, Taiwan
發明人：林韋至、呂坤旺、許賢斌、張偉頷 / LIN WEI-CHIH, LU KUN-WANG, HSU HSIEN-PIN, CHANG WEI-I



專利技術介紹：

「段木搬運機」是專為林下經濟的段木香菇栽培作業所開發的技術，針對菇農在栽培過程的段木搬運繁重、勞動強度高及人力不足等問題，導入省工化機具協同作業。其核心創新在於具旋轉、傾仰與升降等多自由度結構，可執行夾取、翻轉與堆放功能，以滿足菇場不同時期對段木多角度搬移與排列需求。模組化設計讓使用者能依作業需求快速更換夾爪或牙叉元件，提升作業彈性與應用範圍。為因應山區與菇場地形不平整，採履帶式載具以維持穩定與安全。作業時僅需單人遙控操作即可完成夾取與搬運，取代傳統多人高負荷作業，降低人力需求與體力消耗。另可與「自動化植菌機」協同運作，形成搬運、植菌至堆放的連貫流程，提升整體效率與安全。此技術改變段木香菇種植模式，推動林下經濟邁向機械化與智慧化，展現臺灣農林機械創新研發的實力與價值。

Patented technology introduction:

The Multi-Axis Log Handling Machine is a technology developed specifically for log-based mushroom cultivation within under-forest economic systems. It addresses key challenges faced by mushroom growers—such as heavy manual handling, high labor intensity, and manpower shortages—by introducing a labor-saving and collaborative mechanized solution.

The core innovation lies in its multi-degree-of-freedom mechanical structure, which integrates rotational, tilting, and lifting functions to perform clamping, flipping, and stacking operations. This design meets the diverse requirements for multi-angle log relocation and arrangement throughout different cultivation stages. The modular configuration allows users to quickly switch between gripper or fork attachments, enhancing operational flexibility and expanding application scope.

To adapt to uneven terrain in mountainous and forested mushroom farms, the machine utilizes a crawler-type chassis to ensure operational stability and safety. It can be operated entirely by a single operator via remote control, replacing traditional multi-person, high-intensity manual handling while significantly reducing labor demand and physical strain.

In addition, the Multi-Axis Log Handling Machine can work in conjunction with the Automatic Inoculation Machine to form a workflow that integrates log transportation, inoculation, and stacking. This collaboration enhances overall operational efficiency and on-site safety. The technology fundamentally transforms the log-based mushroom cultivation process, advancing the under-forest economy toward mechanization and intelligent automation, and demonstrates Taiwan’s innovative strength in agricultural and forestry machinery development.

農業部林業及自然保育署 / Forestry and Nature Conservation Agency, Ministry of Agriculture, Taiwan

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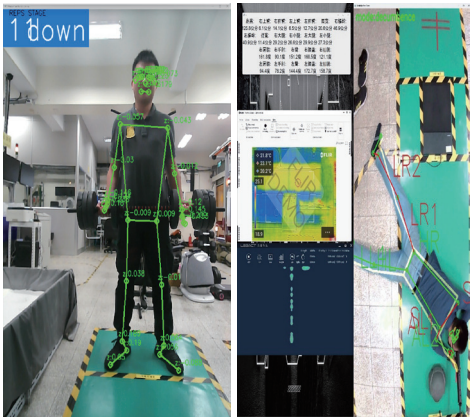
專利技術名稱

動態人因參數量測系統

Dynamic Human Factors Parameter Measurement System

Patent No：(R.O.C. 優先) 114205601(申請中，已辦理領證)
專利權人： 正修學校財團法人正修科技大學 / Cheng Shiu University
發明人：張法憲、張珈銘、蘇上祺、陳柏叡、吳駿翔、梁峻豪、黃冠霖 / FA-SHIAN CHANG, SHANG-CHI,SU, PO-JUI CHEN, JUN-XIANG WU, JUN-HAO LEONG, GUAN-LIN HUANG



專利技術介紹：

本系統為應用於運動訓練中人因工程動態量測系統，包含機台、伺服器、影像擷取模組、熱顯像偵測儀、足壓偵測儀、生理偵測儀、自我檢測螢幕與擴增實境設備。伺服器設置於機台上，並連接各偵測模組與設備，以整合影像、熱感、足壓、生理等多源檢測數據，執行個人資料識別、數據分析與資料庫建置，並於自我檢測螢幕即時顯示影像與量測結果。伺服器內建人工智慧，依使用者指令進行動態或運動人因參數追蹤分析、智慧評鑑模型建構與專業建議生成。另設有擴增實境設計套件，內含場域資料庫、訓練資料庫與編輯器。藉此系統可依不同需求，運用動態化、系統化的訓練方式，精準且高效率地進行軍人、警員、消防員、運動員及復健病患等個人或團體訓練，並蒐集多元數據，結合 AI 技術提供客觀評鑑、姿態矯正與訓練建議及互動。

Patented technology introduction:

This system is a human factors dynamic measurement platform designed for sports training. It comprises a machine, server, image capture module, thermal imaging detector, foot pressure detector, physiological detector, self-assessment display, and augmented reality (AR) device. The server, mounted on the machine, connects all detection modules to integrate multi-source data—including image, thermal, pressure, and physiological signals—for personal identification, data analysis, and database construction. Real-time images and measurement results are displayed on the self-assessment screen. The built-in AI module enables dynamic or motion-based human factor tracking, intelligent evaluation modeling, and professional recommendation generation. The AR design suite includes a field database, training database, and editor. Through this system, users such as soldiers, police officers, firefighters, athletes, and rehabilitation patients can perform dynamic, systematic, and efficient training while collecting diverse data combined with AI to provide objective evaluation, posture correction, and interactive training feedback.

正修學校財團法人正修科技大學 / Cheng Shiu University

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專利技術名稱

基於近場到遠場轉換的天線場型的測量裝置和測量方法

Measuring Device and Measuring Method of Antenna Pattern Based on Near Field to Far Field Transformation

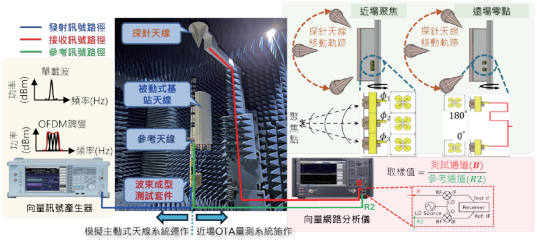
Patent No：R.O.C.：第 I847639 號 / USA：US12270846B2
專利權人： 中華電信股份有限公司 / Chunghwa Telecom Co., Ltd.
發明人：廖昌倫、林宥樺、林健維、游博丞、楊成發、宋德賢、廖文照、侯元昌、黃存健 / Chang-Lun Liao, You-Hua Lin, Jiahn-Wei Lin, Bo-Cheng You, Chang-Fa Yang, De-Xian Song, Wen-Jiao Liao, Yuan-Chang Hou, Tswen-Jiann Huang

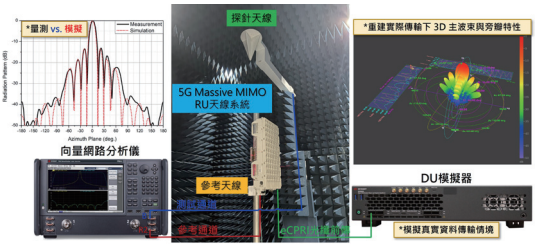
專利技術介紹：

隨著 5G 與未來 6G 通訊技術的演進，基地台天線逐漸採用主動式整合架構，天線、射頻與基頻模組合而為一，傳統射頻端口被光纖介面取代，使既有被動式量測方法難以直接驗證其輻射功率與波束特性。本技術運用近場掃描結合參考天線進行相位重建，精確取得振幅與相位資訊，並透過近遠場轉換推導出完整三維波束場型。創新導入（1）近場聚焦與（2）遠場零點兩大關鍵技術，顯著提升相位重建之穩定性與抗干擾能力，使量測系統能於實際 OFDM 資料調變傳輸下維持高準確度。此技術突破主動式天線近場量測瓶頸，為全台首例可於資料模式下驗證數位波束成型（Digital Beamforming）O-RU 場型之系統，不僅大幅縮短測試時間與成本，更開創次世代通訊量測新典範，展現高度產業應用價值與國際競爭潛力。

Patented technology introduction:

With the advancement of 5G and emerging 6G communications, base station antennas are increasingly adopting active integrated architectures that combine antenna, RF, and baseband modules. As traditional RF ports are replaced by optical interfaces, conventional passive measurement methods can no longer directly verify radiated power or beam patterns. This technology utilizes near-field scanning with a reference antenna for precise phase reconstruction, enabling accurate acquisition of amplitude and phase information, which is then transformed into a full 3D beam pattern through near-field-to-far-field transformation. Two key innovations—(1) near-field focusing and (2) far-field nulling—greatly enhance phase stability and interference immunity, enabling high-accuracy measurements under real OFDM data transmission. As Taiwan’s first system capable of validating digital beamforming O-RU radiation patterns in data mode, this breakthrough greatly reduces test time and cost, setting a new benchmark for next-generation wireless measurement with strong industrial relevance and global competitiveness.





榮獲「美國天線量測技術協會(AMTA)」2024 國際論文首獎 (亞洲首例)

中華電信股份有限公司電信研究院 / Telecom Laboratories, Chunghwa Telecom Co., Ltd.

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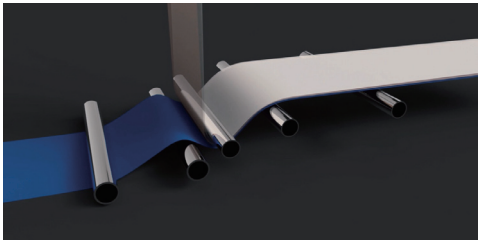
專利技術名稱

塑膠薄膜的製造裝置以及製作方法

FABRICATION APPARATUS AND MANUFACTURING METHOD OF PLASTIC FILM

Patent No：(R.O.C. 優先) I753331
專利權人： 財團法人紡織產業綜合研究所 / TAIWAN TEXTILE RESEARCH INSTITUTE
發明人：蘇德利、陳漢強 / SU, TE LI, CHEN, HAN CHIANG



專利技術介紹：

本技術「塑膠薄膜的製備裝置與製作方法」針對再生塑料在押出成膜過程中常見的「熔體不穩、厚度變異高、冷卻不均」等問題，提出整合式智慧控制解決方案。

系統結合 押出單元、齒輪泵、冷卻輥輪與線上檢測模組，並導入 智慧預測模型，可精準控制薄膜的厚度與寬度，大幅提升回收塑料的成膜穩定性與良率。

透過動態調節進料與冷卻速率，有效避免厚薄不均與表面缺陷，使再生材料的押出穩定度提升、廢品率降低超過30%。

此技術特別適用於 海廢漁網尼龍再生膜 與其他回收塑料的高值化應用，展現臺灣在 循環材料與智慧製程 的創新能量。實現「從海洋到新生」的循環技術，讓每一張薄膜，都多了一份守護地球的力量。

Patented technology introduction:

This technology, " Fabrication Apparatus and Manufacturing Method of Plastic Film," addresses common issues encountered during the extrusion and film-forming process of recycled plastics, such as melt instability, high thickness variation, and uneven cooling, by proposing an integrated intelligent control solution.

The system integrates an extrusion unit, gear pump, cooling rollers, and an online inspection module. It also incorporates an intelligent predictive model that enables precise control of film thickness and width. This greatly enhances the film-forming stability and yield of recycled plastics.

By dynamically adjusting the feeding and cooling rates, the system effectively prevents thickness inconsistency and surface defects, thereby improving extrusion stability and reducing defective products by over 30%.

This technology is particularly suitable for the recycled nylon films made from abandoned fishing nets and other high-value applications of recycled plastics. It showcases Taiwan’s innovation in circular materials and smart manufacturing, realizing the concept of “From Ocean to Rebirth” – making every film a contribution to protecting our planet.

財團法人紡織產業綜合研究所 / TAIWAN TEXTILE RESEARCH INSTITUTE

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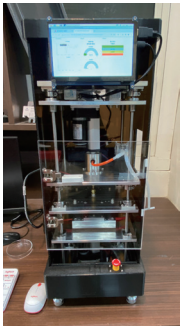
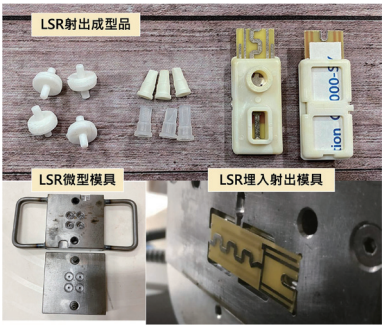
專利技術名稱

微型成型裝置

Injection Mold Device

Patent No：(R.O.C. 優先) I886988
專利權人： 國立高雄科技大學 / National Kaohsiung University of Science and Technology (NKUST)
發明人：鄭瑞鴻 / Jui-Hung Cheng





專利技術介紹：

本微型成型裝置為一種整合伺服驅動、快拆模具與 IoT 製程監控之全電式微型射出設備，針對傳統射出機體積龐大、導入成本高、試模流程冗長與缺乏數據透明等痛點提出解決方案。裝置採直立式無螺桿注射結構，搭配圖形化介面與模組化模具設計，體積縮小約 70%，可於桌面、安全且潔淨環境進行射出作業，適用於少量多樣產品開發、跨領域教學與精密打樣。具備快速換模、滑塊與斜梢等正式機構，並可即時監控射壓、溫度與循環時間，支援雲端回傳、SPC 製程分析與智慧預測維護。相較傳統油壓或氣壓系統，成本僅約 1/5、維護簡易且部署彈性高，可支援異材、嵌件及生醫耗材等應用場域，兼具智慧製造導入、教育推廣與商品化效益，能有效縮短試產流程並提升研發迭代效率。

Patented technology introduction:

The Micro Injection Mold Device is a fully electric desktop molding system that integrates servo actuation, quick-change mold mechanisms, and IoT-based process monitoring. It addresses the limitations of conventional injection machines, including excessive machine size, high setup cost, long trial-molding cycles, and insufficient process transparency. The device adopts a vertical screw-less injection structure with a modular mold design and graphical HMI, reducing system size by approximately 70% and enabling safe, clean, and low-noise operation on a desktop for small-lot production, cross-disciplinary education, and precision prototyping.

The system supports rapid mold replacement and incorporates slider and lifter mechanisms while providing real-time monitoring of pressure, temperature, and cycle time. Through cloud connectivity, SPC analysis, and predictive maintenance, it enhances process intelligence and traceability. Compared with traditional hydraulic or pneumatic systems, the device requires only one-fifth the cost, offers high deployment flexibility, and supports multi-material, insert, and biomedical molding applications - effectively shortening development cycles and improving iterative efficiency.

國立高雄科技大學 / National Kaohsiung University of Science and Technology (NKUST)

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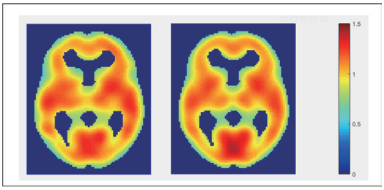
專利技術名稱

腦功能影像數據擴增方法

BRAIN FUNCTION IMAGE DATA AUGMENTATION METHOD

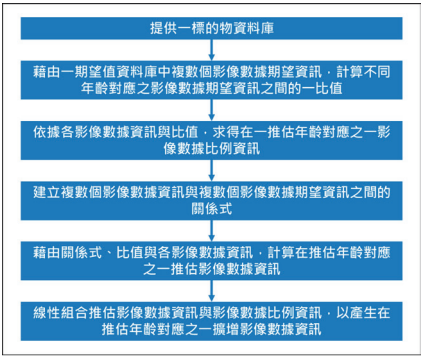
Patent No：(R.O.C. 優先) I698887
專利權人： 國家原子能科技研究院 / NATIONAL ATOMIC RESEARCH INSTITUTE
發明人：曾繁斌、倪于晴、林文彬 / TSENG, FAN-PIN, NI, YU-CHING, LIN, WEN-BIN



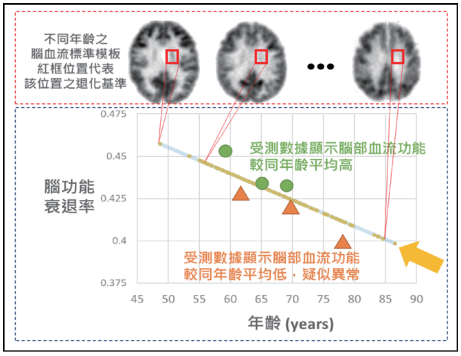
以$f_{74}(x)$(左)產生擴充數據$f_{70}(x)$(右)

專利技術介紹：

本專利「腦功能影像數據擴增方法」是一種創新的數據擴增演算法，可生成具生理意義的腦功能影像數據。本技術針對如單光子電腦斷層掃描、正子斷層掃描等核醫造影，在資料庫數據不足的情況下，能有效擴充影像數據，進而提升機器學習與深度學習的表現，應用於疾病的分類、分析與預測等任務。本專利已實際應用於失智症輔助診斷，並獲得合作醫院與大學研究單位的肯定，後續將進一步推動相關研究與臨床應用，為失智症的早期發現與精準醫療開啓新的方向。



本專利影像擴增流程



全年齡段腦部功能退化基準分布示意圖

Patented technology introduction:

This patent, “Brain Function Imaging Data Augmentation Method”, presents a new algorithm that can generate brain imaging data with real physiological meaning. It works for imaging methods such as Single Photon Emission Computed Tomography (SPECT) and Positron Emission Tomography (PET). When the dataset is too small, this technology can effectively create more data, helping Machine Learning and Deep Learning models perform better in disease classification, analysis, and prediction.

The method has already been applied to dementia diagnosis support and has been recognized by partner hospitals and universities. In the future, it will be further developed for research and clinical use, opening new possibilities for early dementia detection and precision medicine.

國家原子能科技研究院 / NATIONAL ATOMIC RESEARCH INSTITUTE

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專利技術名稱

農用感知驅鳥裝置

Agricultural Sensing Bird Repellent Device

Patent No：(R.O.C. 優先) 新型第 M621977 號
專利權人：農業部花蓮區農業改良場 / Hualien District Agricultural Research and Extension Station, Ministry of Agriculture.
發明人：郭東禎、張光華、林宜緯、林瑋祥 / Dong-Jhen Guo, Kuang-Hua Chang, Yi-Wei Li, Wei-Hsiang Lin

專利技術介紹：

鳥害容易造成作物生長受阻、缺株、減產甚至顆粒無收等危害。因此「農用感知驅鳥裝置」首創以雷射及影像辨識作為核心驅鳥技術，以亂數模式進行 360 度掃描驅鳥，藉此降低鳥類的學習速度。並搭配影像辨識單元，針對鳥類出現區域加強雷射掃描，提升驅離率。試驗成果顯示，每公頃架設 2 支驅鳥器，可降低約 40.7% 的損害率，以水稻為例，可增加約 1.4 公噸的收穫量，增加約 32,900 元的收入。並可應用於養殖業、機場、穀倉等地，緩解鳥害問題。

Patented technology introduction:

Bird damage can severely hinder crop growth, cause plant loss, reduce yields, or even wipe out entire harvests. Therefore, the "Agricultural Sensor Bird Repellent Device" is the first to use laser and image recognition as its core bird repellent technology. Repelling birds with randomized 360-degree scanning patterns to reduce birds' adaptability. To enhance its effectiveness, this device also works with an image recognition unit to intensify laser targeting in active bird zones. Field trials show that installing two units of this device per hectare can reduce crop damage by about 40.7%. In rice, for example, yields can increase by about 1.4 metric tons per harvest, adding around NT$32,900 in revenue. In addition to farming, the device can be applied in aquaculture, airports, barns, and other bird-sensitive areas to help alleviate bird damage.

農業部花蓮區農業改良場 / Hualien District Agricultural Research and Extension Station, Ministry of Agriculture.
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專利技術名稱

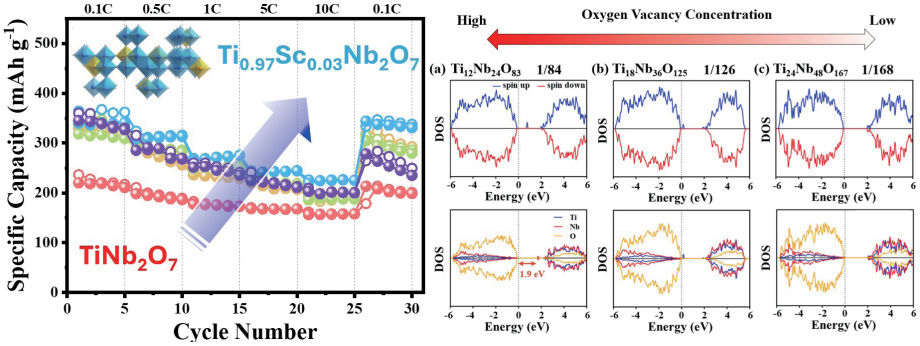
鋰離子電池負極材料

Anode materials for Li ion batteries

Patent No：(R.O.C. 優先) I901566
專利權人： 中原大學 / Chung Yuan Christian University
發明人：劉偉仁、李庚樺 / Liu, Wei-Jen; Li, Geng-Hua

專利技術介紹：

鋰電池商用負極材料石墨的缺點是無法快充，為了提升電池的功率密度與倍率性能，未來的車用電池需要快充的需求，目前較具潛力的商用快充負極材料之一是 TiNb2O7，此材料具有優異的循環穩定性與很好的倍率性能，本次發明接露一個快充鋰離子電池負極材料 Ti1-xScxNb2O7 (0<x<0.3)，我們發現透過 Sc3+ 的摻雜取代 Ti4+ 的格位，可大幅地提升材料的可逆電容量與倍率性能，未來此材料在 3C 產品、工具機以及電動車均有相當的應用潛力。



Patented technology introduction:

The showcased technology is a new solid-state lithium battery material, TiNb2O7 (TNO), featuring high safety and fast-charging capability. With the global push for net-zero emissions, electric vehicles and scooters are increasingly popular, yet conventional lithium batteries face safety risks and slow charging rates. To solve these issues, we developed Sc^{3+} doped TNO, which combines superior safety with rapid charge performance. Current graphite anodes limit charging speed, but TNO offers excellent cycling stability and high rate capability, making it a strong candidate for next-generation batteries. Sc^{3+} doping replaces Ti4+ sites, significantly enhancing reversible capacity and rate performance. This innovative material shows great potential for use in 3C electronics, power tools, and electric vehicles.

中原大學 / Chung Yuan Christian University

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專利技術名稱

A System for Providing Customized Knee Rehabilitation Exercise Programs for Patients

Patent No：10-2025-0111505
Patentee ： Sunmoon University Industry Cooperation Foundation
Inventor's Name：YeonGyo Nam

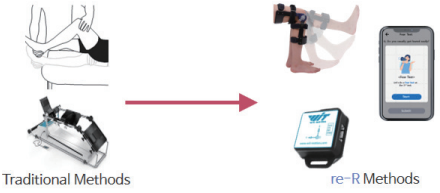
Patented technology introduction:

Invention Introduction： The present invention relates to a system for providing a customized knee rehabilitation exercise program for a patient. Specifically, the present system includes a sensor (e.g., an inertial measurement device, a flexible resistance sensor, or an infrared-based depth sensor) for measuring a range of motion of a patient's knee joint, an input device for inputting a response to a questionnaire evaluating pain and fear of pain after knee surgery, and a control unit for integrating and analyzing such data.

The control unit processes the collected range of motion data, pain assessment results, and fear assessment results to generate a customized rehabilitation exercise program guide tailored to the patient's condition, and then delivers it to the patient through the display unit.

This effectively overcomes the limitations of existing labor-dependent and subjective assessment methods, enabling precise and personalized rehabilitation management based on objective data. As a result, it can support efficient recovery of patients who have undergone knee arthroplasty and increase compliance with rehabilitation programs.

In particular, it supports intelligent rehabilitation tailored to individual recovery paths by helping elderly patients with difficult access to hospitals receive efficient rehabilitation treatment and optimizing exercise prescriptions using AI in the long run.



re-R

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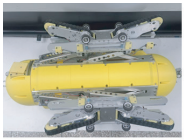
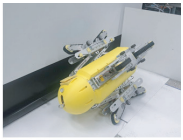
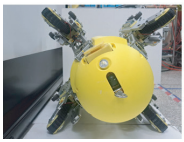
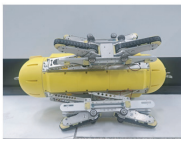
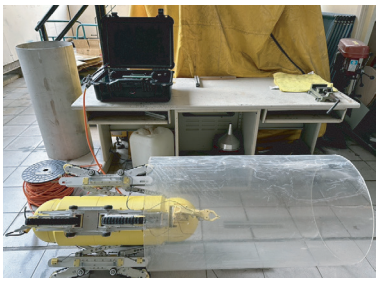
專利技術名稱

大型管道機器人
LARGE PIPELINE ROBOT

Patent No：(R.O.C. 優先) 專利申請案號 113121700 號
專利權人：正修學校財團法人正修科技大學 / CHENG SHIU UNIVERSITY
發明人：張法憲、張泰源、向川澤、賴文彬、蘇上祺、盧冠群、蔡逸承、吳駿翔 / FA-SHIAN CHANG、TAI-YUAN CHANG、CHUAN-TSE HSIANG、WEN-BIN LAI、SHANG-CHI,SU、GUAN-QUN LU YI-CHENG,TSAI、JUN-XIANG,WU


專利技術介紹：

本發明係為一種大型管道機器人，尤指一種透過創新的移動裝置，以在大型管道內獲得最大的行走接觸面積，並且可配合各種大型管道內部之特殊環境變化，可調整的在各種大型管道內順暢的進行移動攀爬及跨越障礙物之機器人結構。至少包含機架、外殼、至少三組伸展裝置與至少三組移動裝置。伸展裝置係環繞間隔設置於機架之外圍，外殼係設置於前述相鄰之兩組伸展裝置之間，透過伸展裝置即可將移動裝置向外推伸或向內收縮。每組移動裝置係設置有一連接支架、兩組頂撐輪組、一伸縮機構及兩組履帶機構。頂撐輪組係設置在連接支架之外側，該頂撐輪組係為具有彈性緩衝功能之被動輪機構，其係用於迫緊抵住管道之內壁，以增加所有履帶機構與管壁之間的接觸面積及正向力。本機器人可用於 24~30 吋之直管及彎管內進行水平和垂直的穩定爬行。具有旋轉機構及折收式機械手臂，可透過更換模組化作業設備以於管道內進行環境檢測、精準定位清潔、焊接、即時影像監控等功能。

Patented technology introduction:

This invention is a large-scale pipeline robot designed for smooth movement, climbing, and obstacle-crossing within pipelines. It includes a frame, housing, at least three extension devices, and three movement devices. The extension devices, spaced around the frame, enable the movement devices to expand outward or retract inward. Each movement device has a connecting bracket, top support wheels with elastic cushioning, a telescopic mechanism, and track mechanisms that press tightly against the pip's inner wall, maximizing contact area and stability. Suitable for 24 to 30-inch straight and curved pipes, this robot also features a rotating mechanism and foldable robotic arm, allowing it to perform environmental detection, cleaning, welding, and real-time video monitoring.

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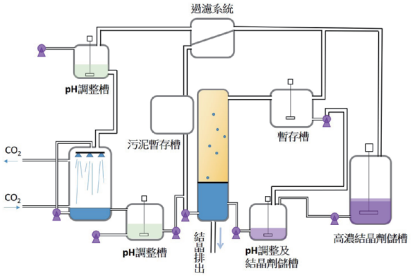
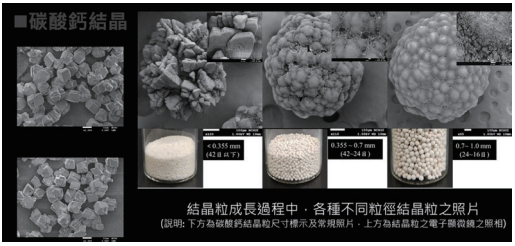
專利技術名稱

以吸收及均質結晶技術回收二氧化碳之方法及其設備

Method and equipment for recovering carbon dioxide using absorption and homogeneous crystallization technology

Patent No：(R.O.C. 優先) I839793
專利權人：國立中興大學 / National Chung Hsing University
發明人：盧明俊 / Ming-Chun Lu





專利技術介紹：

本發明技術先用鹼液捕集煙道氣中二氧化碳，再導入獨步全球的流體化床結晶槽，以均質結晶技術合成碳酸鈣均質結晶顆粒。所產生之高品質輕質碳酸鈣結晶粒，含水量小於 5% 且純度高於 99.5 %，可回收做為各種製程之添加劑，例如：造紙橡膠、塑料、塗料等工業之用途。本技術除應用在一般廠址外，更可再利用海水淡化後之含高鈣之滷水做為鈣來源，將火力發電廠產生之二氧化碳淋洗吸收後，導入均質結晶槽生產碳酸鈣及碳酸鎂，同時為兩廠解決減碳排之問題。取得的碳酸鈣均質結晶產物，其純度在 99.5 % 以上，可轉售給造紙、塑料、橡膠等相關產業做原料替代，解決產物處理的問題。本發明技術是在常溫常壓下進行，不會額外增加排碳量，能實現真正高效率之減碳排。

Patented technology introduction:

This invention first captures carbon dioxide from flue gas using an alkaline solution and then introduces it into an advanced fluidized-bed crystallization reactor, the only one of its kind in the world, to synthesize calcium carbonate crystals using homogeneous crystallization technology. The high-quality calcium carbonate crystals produced have a moisture content of less than 5% and a purity exceeding 99.5%, making them suitable for reuse as additives in various manufacturing processes, such as in the paper, rubber, plastic, and coating industries. This technology can be applied not only at general industrial sites but also by reusing calcium-rich brine from seawater desalination as a calcium source. After carbon dioxide from thermal power plants is absorbed and washed, it is introduced into the homogeneous crystallization reactor to produce calcium carbonate, simultaneously addressing the carbon reduction issues of both plants. The calcium carbonate crystals obtained have a purity of over 99.5% and can be resold to industries such as paper, plastic, and rubber as a substitute for raw materials, resolving the issue of product disposal. This technology operates under ambient temperature and pressure, does not increase carbon emissions, and achieves truly high-efficiency carbon reduction.

國立中興大學 / National Chung Hsing University

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專利技術名稱

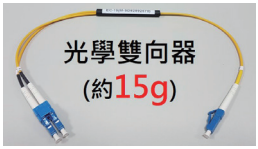
光收發系統
OPTICAL TRANSCEIVER SYSTEM

Patent No：(R.O.C. 優先) 第 I848295 號 / 特許第 7438286 號 (Japan)
專利權人：中華電信股份有限公司 / Chunghwa Telecom Co., Ltd.
發明人：胡晉誠、洪裕涵、廖虹惠、胡秀芳、游幼蘋、賴國祥 / Chin-Cheng Hu、Yu-Han Hung、Hung-Huei Liao、Hsiu-fang Hu、Yu-Ping Yu、Kuo-Hsiang Lai

專利技術介紹：

時間同步是控制及電信網路中的關鍵技術，惟透過全球衛星系統 (GNSS) 接收器獲取世界標準時間有極大的風險，利用光傳輸網 (OTN) 配送精確時間協定 (PTP) 時間信號更為穩定。然而，設備間大多採用雙光纖收送資料，這種實體架構無法得知接收與傳送 (如：多餘的) 光纖長度不同，成為光傳輸網配送時間信號但無法改善 PTP 時間誤差的盲點。

為解決此問題並滿足 5G 網路對高精度時間同步 (±10ns) 的要求，本專利創新研發一種配送 PTP 時間信號的光收發系統，結合光學雙向器 (Optical Duplexer) 除了將設備之間的雙光纖轉換為單光纖同時接收與傳送封包，有效避免光纖長度不同造成的 PTP 時間誤差，還能節省一半的光纖資源，尤其使用傳統的單光纖雙向 BiDi 光模組同樣地也會造成無法改善的 PTP 時間誤差。



Patented technology introduction:

Time synchronization is a critical technology in control and communication networks. However, obtaining the Universal Time Coordinated (UTC) through Global Navigation Satellite System (GNSS) receivers poses significant risks. Using optical transport networks (OTN) to distribute Precision Time Protocol (PTP) time signals is more stable. Nevertheless, most devices use dual-fiber systems for timestamp transmission, and this physical architecture makes the difficulty to find differences in fiber lengths between receiving and sending, which will lead to larger PTP time errors in optical transport networks.

To solve this problem and meet the high-precision time synchronization requirements (±10ns) of 5G networks, this patent innovatively develops an optical transceiver system for distributing PTP time signals. By integrating an Optical Duplexer, it converts dual-fiber connections between devices into a single-fiber system for simultaneous packet transmission and reception. This effectively avoids PTP time errors caused by differences in fiber lengths and saves half of the fiber costs. Traditional single-fiber bidirectional (BiDi) optical module has a blind spot when it also leads to larger PTP time errors.

中華電信研究院 / Chunghwa Telecom Laboratories

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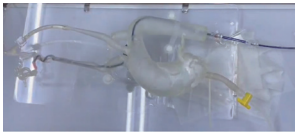
專利技術名稱

血管介入微創手術教學模擬裝置之影像平台及教學方法

3D-print vascular simulator and real-time infrared imaging system

Patent No：(R.O.C. 優先) 發明第 I797654 號
專利權人：奇美醫療財團法人奇美醫院 / Chi-Mei Medical Center
發明人：吳德昌、郭進榮、王志中、李健逢、陳志成、翁瑞侑 / Te-Chang Wu, Jinn-Rung Kuo, Jhi-Joung Wang, Chien-Feng Li, Zhih-Cherng Chen, Jui-yu Weng



專利技術介紹：

本團隊利用 3D 列印及三維影像血管資料庫，建立了不同難易程度且能反覆在血管攝影機下操作的“擬真”全身性血管模具，以做為初學者熟悉神經血管介入手術的訓練平台。這二年來更進一步利用 3D 列印材料選擇、機械工程和光學影像技術來建立一個完整的血管模具操作平台，目前已達成以下二個具體目標：

(1) 使用軟性材質列印顱內血管模具，提供類似血管的彈性及柔軟度的中空血管模具。另可延伸結合顱外血管模具 (頸動脈、主動脈、股動脈)，提供完整的神經血管介入手術體驗。

(2) 紅外線操作平台：利用紅外線光源及攝影機的即時導管介入影像，可模擬 x-ray 情境下的血管攝影影像，讓血管導引訓練可以在無輻射的環境下進行。平台設計為可移動式，可在任何場域做訓練與教學，不需局限在血管攝影室內。

Patented technology introduction:

Using 3D printing technology and the 3D vascular database, we had fabricated patient-specific extracranial and intracranial vascular simulators with different vascular tortuosity. A continuous pulsatile pump was also incorporated into the vascular simulator. It could provide an efficient platform for neurovascular intervention training and pre-operation simulation while dealing with challenging vascular lesions.

To diminish the radiation dose while training procedures, a real-time infrared imaging system with rotatory C-arm could be applied for imaging guidance instead of the traditional fluoroscope in the angio-suite. With infrared imaging system, the heavy protective apron is no longer necessary for the participants. The simulation procedure could be held in a meeting room and no longer confined to the angio-room. The infrared imaging system could be a practical demonstration platform for endovascular devices manufacturers.

奇美醫院 / Chi-Mei Medical Center

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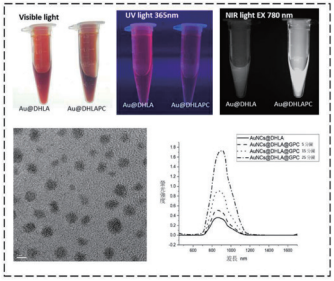
專利技術名稱

近紅外二區螢光複合材及其製備方法與用途

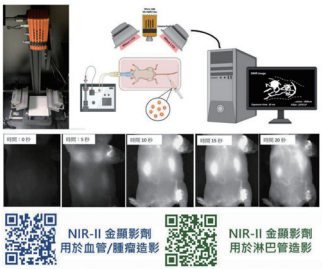
NEAR-INFRARED-II FLUORESCENT COMPOSITE, ITS PREPARATION METHOD AND USES THEREOF

Patent No：(R.O.C. 優先) 中華民國發明專利第 I810117 號
專利權人：中原大學 / CHUNG YUAN CHRISTIAN UNIVERSITY
發明人：林政鞍、孫翊堂、陳民樺 / CHENG-AN LIN、YI-TANG SUN、MIN-HUA CHEN



專利技術介紹：

前哨淋巴結是癌症轉移的前哨站，由於前哨淋巴結位於皮下深處，搭配放射性同位素與藍色顯影劑是常見前哨淋巴結的定位與活檢策略，本專利技術提出一種非輻射螢光金奈米團簇顯影劑，控制金奈米團簇落於 2 奈米之量子侷限效尺度並應發出高亮度近紅外光，光譜涵蓋 800-1200nm，表面修飾天然甘油磷酸膽鹼與高生物相容性的聚乙二醇高分子，再透過近紅外二區銦鎵砷相機 (五鈴光學 / 產學合作) 可取的深層血管與淋巴管即時造影影像，金顯影劑亦可進入腫瘤微環境進行造影，本專利技術近紅外二區螢光顯影劑不僅可提供更清晰的深度造影，更可直接應用於現有臨床螢光造影的醫療儀器上，未來更有機會應用於臨床手術術中組織定位、前哨淋巴結活檢與腫瘤切除等生醫應用，極具臨床醫用應用的潛力。



Patented technology introduction:

The sentinel lymph node serves as a primary site for cancer metastasis. Due to its location deep within the subcutaneous layer, traditional localization and biopsy methods for sentinel lymph nodes often rely on radioactive isotopes and blue dyes. This patented technology introduces a non-radioactive fluorescent gold nanocluster contrast agent, with nanoclusters precisely engineered to approximately two nanometers, falling within the quantum confinement scale, to emit high-intensity near-infrared (NIR) light in the 800–1200 nm range. The nanocluster surfaces are modified with natural glycerophosphorylcholine and highly biocompatible polyethylene glycol polymers, ensuring compatibility with biological environments. By employing a near-infrared II (NIR-II) InGaAs camera (developed by ISUZU OPTICS), this technology enables real-time imaging of deep-seated blood vessels and lymphatic structures. Additionally, the NIR-II fluorescent gold contrast agent can penetrate the tumor microenvironment, enhancing imaging resolution in these regions. This NIR-II fluorescent contrast agent provides clearer deep-tissue imaging and can be easily integrated into existing clinical fluorescence imaging equipment. It holds considerable promise for applications in intraoperative tissue localization, sentinel lymph node biopsy, and tumor resection, underscoring its significant potential in biomedical and clinical settings.

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專利技術名稱

移動式多功能智能步態訓練機

Mobile Multi-Functional Intelligent Gait Training Machine

Patent No：(R.O.C. 優先) 發明第 I836688 號
專利權人：國立中興大學、高雄醫學大學 / National Chung Hsing University, Kaohsiung Medical University
發明人：李聯旺、陳嘉炘 / Lee Lian-Wang, Chen Chia-Hsin

專利技術介紹：

本技術結合動態減重步態訓練系統、下肢外骨骼、即時生理監測與腦機介面，為中風患者提供有效且全面的復健方案，以解決因腦損傷導致的步態控制能力下降問題。該系統具備強度可調、外骨骼輔助、移動式動態減重、人機協同及生理參數即時監測功能，能夠靈活適應不同患者的需求。即時生理監測可以確保訓練過程的安全性，動態減重功能則有效減輕患者負擔，提升復健的舒適性與效果。這項技術的創新之處在於結合腦機介面，使患者能更主動參與復健，促進腦神經功能重塑，加速肢體功能恢復，有助於提升患者心肺功能與整體訓練效果，進而減輕患者的家庭與社會負擔。

Patented technology introduction:

This technology integrates a dynamic body weight support gait training system, lower limb exoskeleton, real-time physiological monitoring, and a brain-computer interface to provide effective rehabilitation solutions for stroke patients. It addresses the decline in gait control ability caused by brain injuries. Compared to traditional bulky equipment, this system features adjustable intensity, exoskeleton assistance, mobile dynamic body weight support, human-machine collaboration, and physiological monitoring functions. These features allow it to adapt flexibly to patient needs and enhance training effectiveness. This innovative technology helps improve patients' cardiopulmonary function, promotes neural remodeling in the brain, accelerates limb recovery, and increases patient engagement, significantly reducing the burden on families and society.

國立中興大學 / National Chung Hsing University

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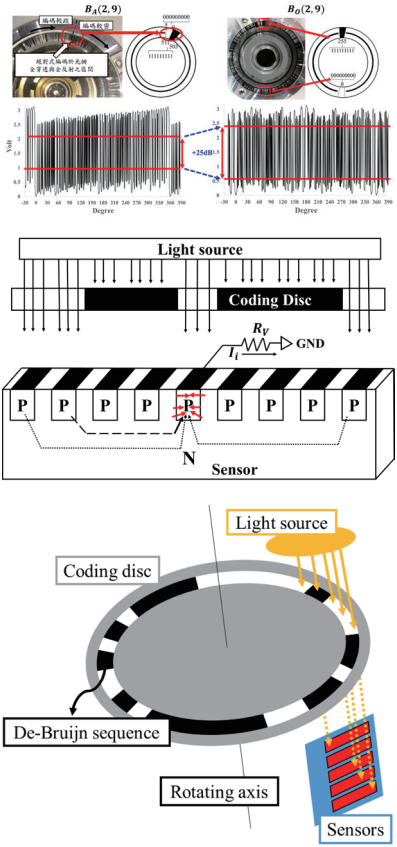
專利技術名稱

旋轉式碼盤及其設計方法

Rotary code disk and method for designing the same

Patent No：(R.O.C. 優先) 中華民國發明專利第 I722886 號
專利權人：國立陽明交通大學 / National Yang Ming Chiao Tung University
發明人：歐陽盟、王廷峰、顏永哲、廖俊傑 / OU-YANG, MANG / WANG, TING-FENG / YAN, YUNG-JHE / LIAO, CHUN-CHIEH



專利技術介紹：

對於高精度絕對式光學旋轉編碼器，當碼盤半徑固定時，越高的解析度代表更高密度的感測器陣列，使光電流餘暉雜訊加劇影響編碼器準確率。絕對編碼使用的是連續環形德布魯因數列，不同數列將造成不同程度餘暉雜訊，進而影響編碼準確率。以 9 位元絕對編碼為例，其數列解存在約 1075 個，如何從大量的數列解中，找出能降低餘暉雜訊影響的數列，進而提升編碼讀取正確率是鮮少有人探討的問題。因此本專利提供一種快速且有效的篩選方法，能夠找出較佳的德布魯因數列用於環形絕對編碼。在不改變硬體架構、軟體演算法、感測器設計與製程的情況下，僅透過改變編碼，就能有效提升編碼準確率。與傳統 M-Code 比較，位元錯誤率由 262.76ppm 減至 0.82ppm，有效提升 25dB 的訊雜比。

Patented technology introduction:

High-precision absolute rotary optical encoders use a high-density sensor array, which leads to significant photocurrent blooming noise, reducing the encoder accuracy. Absolute encoding in rotary encoders is based on a type of De-Bruijn sequence, with different sequences producing varying levels of photocurrent blooming noise that affect encoder accuracy. For a 9-bit absolute encoder, there is an impressive total of 1075 possible sequences. Finding sequences from the vast number of possibilities that can reduce the impact of the blooming noise, thereby improving encoder accuracy, is a topic that has rarely been explored. This patent provides a quick and effective method for identifying optimal De-Bruijn sequences for rotary absolute encoding. The encoders can enhance accuracy by applying these sequences without changing the hardware, software, sensor design, or sensor fabrication process. Experiments showed that by using the encoding provided by this patent, the bit error rate of the encoder was reduced from 262.76 ppm to 0.82 ppm. This approach effectively improved the signal-to-noise ratio by 25 dB compared to an encoder using traditional M-Code.

國立陽明交通大學 / National Yang Ming Chiao Tung University

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專利技術名稱

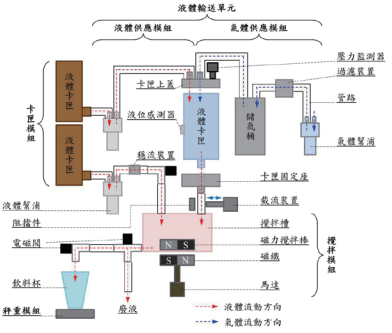
智能飲品調製設備

Smart beverage preparation equipment

Patent No：(R.O.C. 優先) TW I842581
專利權人：財團法人食品工業發展研究所 / Food Industry Research and Development Institute
發明人：侯佳延、劉峰齊 / HOU, JIA-YAN、LIU, FENG-CHI

專利技術介紹：

本專利為一種可自動調製飲品的設備，整合氣壓與機械力之複合式原料輸送技術，透過幫浦進行物料之補充，使用氣壓進行定量充填，搭配非接觸式截流裝置，以降低作動時機械結構接觸之風險，內建混製機構，可快速且均勻的混製飲品，並導入重量監測技術控制充填至飲料杯內的飲料量。智能飲品調製設備能依使用端的需求進行模組化之擴充組裝，且透過 IoT 之整合，可即時進行設備資訊更新、監控和運算分析。另，可依消費者需求智動調製適合飲品配比，亦可兼顧個人營養，達到操作與調製程序標準化、定量充填精準化和營養調配智動化。



Patented technology introduction:

This patent is an equipment that can automatically prepare beverages. It integrates pneumatic and mechanical liquid conveying technology. It replenishes materials through a pump, uses air pressure for quantitative filling, and is equipped with a non-contact cut-off device to reduce the risk of mechanical structure contact during operation. It has a built-in mixing mechanism that can mix beverage quickly and evenly. It also has weight monitoring technology to control the amount of beverage filled into the drink cup. Smart beverage preparation equipment can expand the module according to the needs of the user, and through the integration of IoT, equipment information can be updated, monitored and analyzed in real time. In addition, it can intelligently prepare suitable beverage proportions and personal nutrition according to consumer needs, achieving standardization of operation and preparation procedures, precise quantitative filling, and intelligent nutrition preparation.

財團法人食品工業發展研究所 / Food Industry Research and Development Institute

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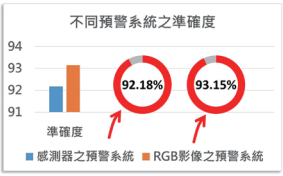
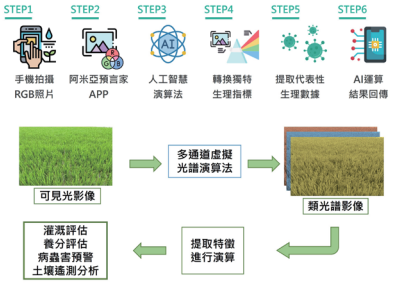
專利技術名稱

預測水稻用水需求的系統及方法

SYSTEM AND METHOD FOR FORECASTING WATER DEMAND OF RICE

Patent No：(R.O.C. 優先) I821719
專利權人：國立中興大學 / NATIONAL CHUNG HSING UNIVERSITY
發明人：朱彥煒、詹永寬、賀端華、余淑美、羅舜芳、梁育臺、陳俊傑、簡靖軒 / CHU, YEN-WEI, CHAN, YUNG-KUAN, HO, TUAN-HUA, YU, SU-MAY, LO, SHUEN-FANG, LIANG, YU-TAI, CHEN, CHUNCHIEH, CHIEN, CHING-HSUAN





專利技術介紹：

本發明結合感測器偵測水稻葉溫、株高及葉綠素含量，開發出智慧灌溉預警系統。與傳統依賴環境感測器不同，本系統直接監測水稻的生理狀態，並考慮方便性、成本效益與性別友善性，基於此技術開發出智慧手機拍攝作物影像即可進行預測，轉換為類光譜作物生理訊號進行預測，於實際場域驗證系統準確度達 93-96%。該技術可提供即時灌溉建議，提高水資源利用效率，減少甲烷排放，降低農業碳足跡。每公頃可節水約 7,000 噸，若擴展至全台 22 萬公頃稻田，可節省約 15.4 億噸的用水，節水量相當於 4.16 座翡翠水庫，約為全台半年生活用水。此系統在水稻及其他作物管理中應用廣泛，並推動農業可持續發展，已在國內成功應用並擴展至印尼等東南亞國家。

Patented technology introduction:

The invention combines sensors to monitor rice leaf temperature, plant height, and chlorophyll, creating a smart irrigation warning system. Unlike traditional methods relying on environmental data, it directly assesses crop physiology, is convenient, cost-effective, and gender-inclusive. Smartphone-captured crop images are converted into pseudo-spectral signals, achieving a 93-96% prediction accuracy in field tests. The system provides real-time irrigation advice, boosting water efficiency, reducing methane emissions, and lowering the agricultural carbon footprint. It saves about 7,000 tons of water per hectare; if applied to Taiwan's 220,000 hectares of rice paddies, it would save 1.54 billion tons—equal to 4.16 Feitsui Reservoirs or half of Taiwan's annual household water use. Widely applicable to the management of rice and other crops, the system supports sustainable agriculture and has been successfully implemented in Taiwan and extended to Indonesia.

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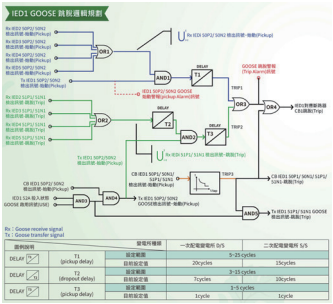
專利技術名稱

導入 GOOSE 應用策略的保護邏輯規劃及供電系統

PROTECTION LOGIC PLANNING BASED ON GOOSE APPLICATION STRATEGY AND POWER SUPPLY SYSTEM

Patent No：(R.O.C. 優先) 中華民國專利號 I838902 (2024, April 11)
專利權人：台灣電力股份有限公司 / Taiwan Power Company
發明人：洪永輝、吳立成、蔡隆田、陳炯彰、周瑞年、劉哲良、陳仁忠、吳維山、彭怡雯 /
HONG, YOUNG-HUEI, WU, LEE-CHENG, TSAI, LUNG-TIEN, CHEN, JIONG-ZHANG, CHOU, JUI-NIEN, LIU, CHEH-LIANG, CHEN, JEN-CHUNG, WU, WEI-SHAN, PENG, YI -WEN

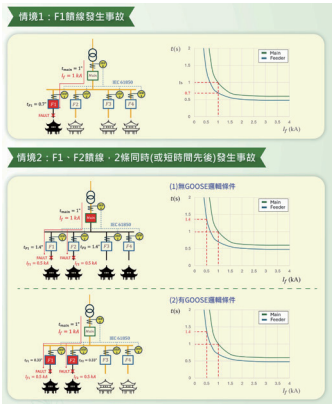


專利技術介紹：

配電級保護系統多為放射狀網絡，當兩條或兩條以上饋線同時 (或短時間內先後) 發生事故，會破壞原本的保護協調性，導致主斷路器提前跳脫，造成其他非故障配電饋線也全部停電。

變電所智慧化過程中，IEC 61850 通訊標準可讓不同廠家的智慧型電子裝置 (IED) 實現互操作，使訊息傳送更自由及彈性。其中，IEC 61850 的 GOOSE 透過光纖快速傳輸 IED 相關資訊，有效節省 IED 所需的輸入 / 輸出 (I/O) 點，並減少現場實體線配置，達到更快速、穩定的保護。

本發明專利導入 GOOSE 應用策略的保護邏輯，可以將兩條或兩條以上故障饋線加速跳脫，以確保該協調性正常運作，並已運用於台電的供電系統中。



Patented technology introduction:

The distribution level protection systems are mostly radial networks. When faults occur simultaneously (or within a short interval) on two or more feeders, the original coordination breaks down. It results in premature tripping of the main circuit breaker and a power outage that can affect other feeders without faults.

In the process of substation intelligence, interoperability among Intelligent Electronic Devices (IEDs) from different manufacturers and protocols is enabled by IEC 61850, which enhances flexibility in message transmission. Furthermore, the Generic Object Oriented Substation Event (GOOSE) protocol in IEC61850 rapidly transmits IED status through optical fiber, reducing the number of required I/O points for IEDs and minimizes site hard wiring. It thereby achieves faster and more reliable protection.

This patent discloses a protection logic based on a GOOSE application strategy, ensuring the correct coordination when two or more feeders have faults and trip previously before the upstream circuit breaker. This approach has been successfully implemented and demonstrated in the power supply system in Taiwan.

台灣電力股份有限公司 (電驛室) / Taiwan Power Company (Relay Office)

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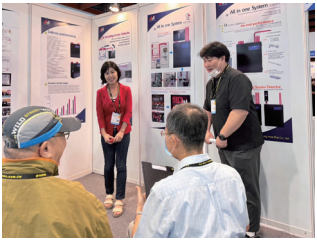
專利技術名稱

CLEANING DEVICE OF AIR SUCTION TYPE SENSOR

Patent No：10-2023-0027141
Patentee：SUNGWHA PLUS
Inventor's Name：SHIN HYUNHO

Patented technology introduction:

The Sunghwa Plus Co., Ltd. has been awarded the Platinum Prize at the Taiwan Inno-Tech Expo for its air-suction smoke detector equipped with an automatic maintenance system (All-in-One) which has received high acclaim. The air-suction smoke detector is an advanced detection system that continuously intakes air to detect microscopic particles, enabling early fire detection. Its fine particle analysis capabilities allow it to detect fires at an early stage. However, it also has limitations, as it can be triggered by other environmental factors such as humidity or smoke. Sunghwa Plus's self-developed automatic maintenance system addresses these issues effectively. When air is drawn into the detector,a cyclone hopper dust collector filters fine dust particles and discharges them downwards. A water trap removes any water that may have formed from humidity or condensation. The system also vacuums impurities and hardened substances from pipe holes in real-time,functioning similarly to a vacuum cleaner's dust disposal system. With dual filtration, the risk of false alarms is minimized, according to Sunghwa Plus. Notably, Sunghwa Plus has independent subsidiaries in Indonesia and Vietnam, and this award from the Taiwan Inno-Tech Expo is expected to strengthen its export efforts. The company aims to promote its air-suction smoke detectors globally.



SUNGWHA PLUS

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專利技術名稱

One-piece polarizing interferometer and snapshot spectro-polarimetry applying the same

Patent No：10-1812608
Patentee：Jeonbuk National University Industrial Cooperation Foundation
Inventor's Name：Daesuk Kim

Patented technology introduction:

Snapshot-type high-speed spectroscopic polarization information analysis device used for semiconductor inspection, etc.

Existing technology uses mechanical rotating mechanisms or electrical modulation devices and has precise measurement capabilities, but the measurement speed is slow, measured in seconds. Existing snapshot technology is vulnerable to disturbances and difficult to implement due to the limitations of spectral and resolution when obtaining the Stokes vector through complex spectra.

By utilizing an integrated polarization interferometer, multi-wavelength information can be measured with high precision and high speed using only interference spectral information acquired at one time. When applied to semiconductor process lines, the entire thin film patterning non-uniformity can be measured within 1 hour through line scanning rather than point measurement.

Technology Readiness level is TRL 4: Working Model Development.

Thin film process fields such as semiconductors, displays, solar cells, and secondary batteries.

Spectroscopic ellipsometers provide more precise measurements and a larger range of applications than conventional single-wavelength ellipsometers. Spectroscopic ellipsometers are predicted to become more widely used in a number of industries, including semiconductors, photovoltaics, and biomaterials, as the technology advances and costs come down.

This is a technology that can quickly detect the uniformity or micro-defects of nano-patterns or nano-films during semiconductor inspection.

Jeonbuk National University Industrial Cooperation Foundation

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http://www.norilab.com/ (Daesuk Kim Optical Metrology Laboratory)

2023
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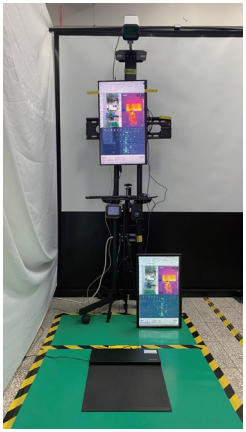
Platinum Awards

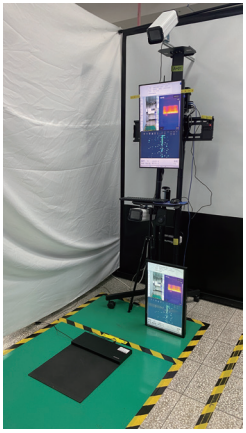
專利技術名稱

人因參數量測系統

Human parameters measurement system

Patent No：(R.O.C. 優先) M644082
專利權人：正修學校財團法人正修科技大學 / CHENG SHIU UNIVERSITY
發明人：張法憲、蘇上祺、陳政方、盧冠群、謝尚祐、顏敬哲 / CHANG, FA-SHIAN / SU, SHANG-CHI / CHEN, CHENG-FANG / LU, GUAN-QUN / XIE, SHANG-YOU / YAN, JING-ZHE





專利技術介紹：

人因參數量測系統的組成包含一機台、一伺服器、一影像識別模組、一熱顯像偵測儀、一足壓偵測儀、一生理偵測儀及複數台自我檢測螢幕。伺服器結合機台上連接影像識別模組、熱顯像偵測儀、足壓偵測儀、生理偵測儀及自我檢測螢幕，整合設備可以檢測數據並進行身分識別、數據分析及資料庫建置，透過自我檢測螢幕播放即時檢測影像及數據。本系統作為一數位教練或數位教官使用，以高效率的獲得軍人、警員、消防員、運動員等各種專業項目人員或團體的訓練數據、生理數據、動作數據及姿態數據，讓每個人員皆可清楚的了解自己在訓練、生理、動作及姿態上的缺失及問題，並能夠快速的進行改正或調整裝備，使每個人員皆能夠以最佳的狀態來進行各項任務。

Patented technology introduction:

The composition of the human factors parameter measurement system includes a machine, a server, an image recognition module, a thermal imaging detector, a foot pressure sensor, a physiological sensor, and multiple self-monitoring screens. The server is integrated with the machine and connected to the image recognition module, thermal imaging detector, foot pressure sensor, physiological sensor, and self-monitor.

This integrated equipment is capable of data collection, identity recognition, data analysis, and database establishment, and it can display real-time monitoring images and data on the self-monitoring screens.

正修科技大學 / CHENG SHIU UNIVERSITY

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專利技術名稱

用於執行全內反射散射量測的裝置與方法

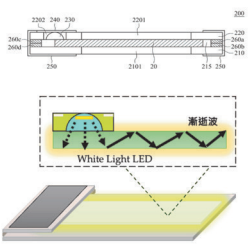
DEVICE AND METHOD FOR PERFORMING TOTAL INTERNAL REFLECTION SCATTERING MEASUREMENTS

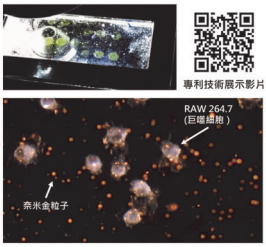
Patent No：(R.O.C. 優先) 中華民國發明專利第 I798041 號
專利權人：中原大學 / Chung Yuan Christian University
發明人：林政鞍、侯姿吟、李祐瑋、蔡育秀、王明誠 / Cheng-An Lin / Tzu-Yin Hou / You-Wei Li / Yuh-Show Tsai / Ming-Cheng Wang

專利技術介紹：

微奈米生醫檢測須在微米尺度下提供單一奈米粒子解析，可作為生醫外泌體檢測、病毒感測、癌細胞與奈米載體交互作用提供最直接的光學檢測資訊。暗視野顯微技術是目前可提供觀測奈米世界的重要工具，本研究團隊創新研發之寬場暗視野全內反射光學模組專利技術，突破傳統暗視野技術，經由改良後的邊緣光路結構，在無需聚光鏡輔助下便能提供傳統顯微鏡微奈米的觀測視野，讓奈米生醫材料可以更容易被觀測，甚至與細胞的交互作用，都能更方便被觀察與紀錄，從奈米等級影像至微米等級影像，皆能於本專利技術實現。故本專利「用於執行全內反射散射量測的裝置與方法」可將光學模組整合至各種顯微鏡上，升級成為微奈米生醫顯微鏡，更可應用於奈米生物晶片檢測，有機會成為未來臨床檢測技術新工具。

Patented technology introduction:





Microscale & nanoscale biomedical detection required the wide surveillance field down to single nanoparticle resolution, which can provide the comprehensive bio-information for biomedical exosome detection, virus sensing, and the interaction between cancer cells with nanocarriers etc. Dark-field microscopy is the key methodology to visualize the nanoworld. However, complicated optical design and operating procedures limit the development of this dark-field technology. The dark-field total internal reflection optical module via edge illumination is a groundbreaking innovation compared to traditional dark-field technology. Through an innovative optical module, it completely replaces the need for a condenser lens in dark-field microscopy. Consequently, this patented technology enables the observation of various nano-biomedical materials, including targeted gold nanoparticles, clinically relevant exosomes, and even single nanometer-scale biomedical materials. Furthermore, dark-field microscopy offers the advantage of observing cells without the need for staining. This allows for the observation of living cell activities and provides clearer visualization of the internal structures compared to bright-field microscopy. In conclusion, this patent "DEVICE AND METHOD FOR PERFORMING TOTAL INTERNAL REFLECTION SCATTERING MEASUREMENTS" can adapt to all kinds of microscope to become advanced nanobio microscopy. It is potential to apply to inspection tools of nano-biochip as well as future clinical test.

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專利技術名稱

可換裝紗網的紗窗及其捲紗裝置

Screen window with replaceable screen and screen winding apparatus thereof

Patent No：(R.O.C. 優先) I708888
專利權人：良展新科技股份有限公司 / Onwell Curtain & Screen Co., Ltd.
發明人：樊秋蘭、郭勁佑 / Fan, Chiu-Lan / Kuo, Chin-Yu

專利技術介紹：

一種可換裝紗網的紗窗及其捲紗裝置，安裝在一窗框，且適用於捲收及拉張一紗網，包含可卸離地連接於該窗框且連接於該紗網一邊緣的一捲紗單元、滑行於該窗框間的一拉張單元，及連接於該紗網的另一邊緣的一組合單元。該拉張單元界定有一收納槽。該組合單元在一安裝模態與一換裝模態間變化，在安裝模態時，該組合單元被收納在該拉張單元的收納槽內，且與該拉張單元形成連動，並用於拉張該紗網，在該換裝模態時，該組合單元脫離該拉張單元。藉此，使連接該紗網的捲紗單元與組合單元形成一個獨立且能夠分離的模組，進而提升換裝紗網時的方便性與簡易性。

Patented technology introduction:

Disclosed are a screen window with a replaceable screen and a screen winding apparatus thereof. The screen window is mounted on a window frame and is suitable for winding and tensioning a screen. The screen window includes a screen winding unit detachably connected to the window frame and connected to one edge of the screen, a tensioning unit sliding between the window frames and a combination unit connected to the other edge of the screen. The tensioning unit defines a storage groove. The combination unit is changed between a mounting state and a replacing state. When the combination unit being in the mounting state, the combination unit is stored in the storage groove of the tensioning unit, is linked with the tensioning unit and is used for tensioning the screen. When the combination unit being in the replacing state, the combination unit is separated from the tensioning unit. Therefore, the screen winding unit connected with the screen forms an independent and separable module together with the combination unit, and furthermore, the convenience and simplicity when the screen is replaced are improved.

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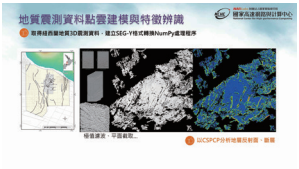
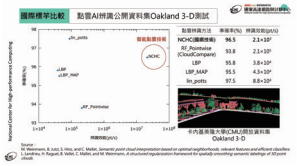
專利技術名稱

校正異常點雲資料之方法

METHOD FOR CORRECTING ABNORMAL POINT CLOUD

Patent No：(R.O.C. 優先) 發明第 802827 號
專利權人：財團法人國家實驗研究院 / NATIONAL APPLIED RESEARCH LABORATORIES
發明人：王志維、賴傳霖、郭嘉真、吳毅成 / WANG, CHIH WEI / LAI, CHUAN LIN / KUO, CHIA CHEN / WU, I CHEN





專利技術介紹：

光達等掃描器能取得精準空間資訊，結合相機以獲得彩色點雲。但光達與相機間會有對位誤差或不同時等問題，拼接多個掃描時還可能遇到光照差異，常使點雲出現難以人工修復的錯誤色彩對應或明顯拼接痕跡。本專利結合點雲辨識分割、局部掃描分析、色彩空間分割、顏色迴歸等模組，針對點雲錯誤色彩問題，以機器學習達成自動辨識分類、異常顏色偵測及顏色校正，相比人工修復時間由 6 個月縮減為 1 個月。其中，點雲辨識分割模組於點雲 AI 辨識公開資料集 Oakland 3-D 測試，準確率超過 95% 達國際頂尖水準，其輕量化的特徵設計，辨識速率與各一流演算法相比有 100 倍的提升。本專利於 2021 年獲 R&D 100 Awards、2023 年獲 TIE 鉑金獎，可廣泛應用於建築、自動駕駛、3D 地質、文物、生醫顱顏與足部建模等。

Patented technology introduction:

Lidar technology captures precise spatial data, combined with RGB cameras which captures color data. However, challenges such as registration deviation, sensor asynchrony, and illumination disparities can introduce color defects to the point cloud.

This patent presents an innovative approach that leverages point cloud semantic segmentation, local scanning analysis, color quantization, and regression modules. These modules enable automatic recognition, classification, color defect detection, and correction through machine learning techniques. This process significantly reduces the restoration time from six months to just one.

The point cloud semantic segmentation module stands out with an impressive overall accuracy exceeding 95%. This accuracy was benchmarked against the Oakland 3-D Point Cloud Dataset and operates at speeds over a hundred times faster than existing top-notch algorithms. This patent has advantages that can be widely applied in fields such as architecture, autonomous driving, 3D geology, cultural heritage, craniofacial and podiatric modeling, and more.

財團法人國家實驗研究院國家高速網路與計算中心 /
National Center for High-performance Computing, NARLabs

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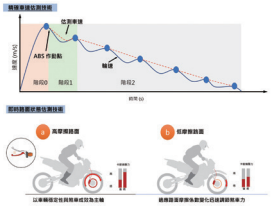
專利技術名稱

根據路面摩擦特性的煞車控制方法

BRAKING CONTROL METHOD ACCORDING TO FRICTION OF ROAD SURFACE

Patent No：(R.O.C. 優先) I718672
專利權人：財團法人車輛研究測試中心 / Automotive Research & Testing Center
發明人：林信全、魏嘉樂 / Hsin-Chuan Lin, Jia-Le Wei



專利技術介紹：

防鎖死煞車系統 (Anti-lock Braking System, ABS)，使車輪滾動並提供最大減速、維持轉向可控性，提升車輛煞車穩定性，具備本專利技術之國產化 ABS 性能媲美世界大廠。

• 精準車速估測技術

ABS 需要有精準的車速計算、控制車輪打滑程度，本專利由輪速精準估測車速，甚至可提供給車身動態穩定系統與自駕車電控煞車系統進行煞車控制。

• 即時路面狀態估測技術

使 ABS 根據路面狀態快速反應，在行經乾燥路面與潮濕路面變換的路面都能加速反應，提高煞車反應能力。

• 即時優化調整 ABS 控制參數技術

根據上述估測結果，ABS 微調煞車壓力的變化幅度，讓 ABS 在濕滑路面以車輛煞車穩定性略高最大減速成效為優先；在乾燥路面則考量車輛煞車穩定性與減速成效，藉以提高在各路面之煞車效率與車輛穩定性。

Patented technology introduction:

Commercially available vehicles cannot directly measure the vehicle speed but only estimate from the wheel speed, which is required for the ABS control when a vehicle brakes in an emergence. Therefore, this patent provides a method that can accurately estimate the vehicle speed to calculate the wheel slip and control the degree of wheel slip.

This patent includes road friction coefficient estimation technology, which can provide the current road friction coefficient to the vehicle computer and electronically controlled braking system. It allows the electronically controlled braking control system to make immediate responses based on current road conditions, such as allowing ABS to quickly respond to various road surfaces.

A method for real-time optimization and adjustment of ABS control parameters is also included in this patent by the combination of the above-mentioned accurate vehicle speed estimation technology and real-time road friction coefficient estimation technology. It allows the ABS to finely adjust the braking pressure and braking force of each wheel through varying the parameters. That technology improves braking efficiency and vehicle stability on various road surfaces.

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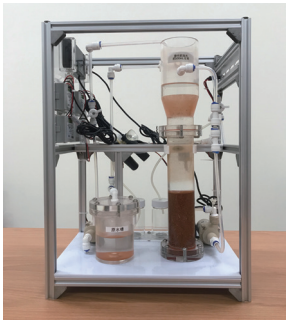
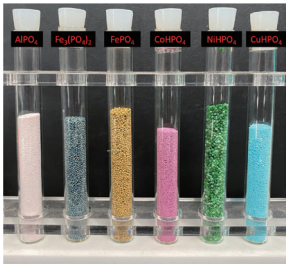
專利技術名稱

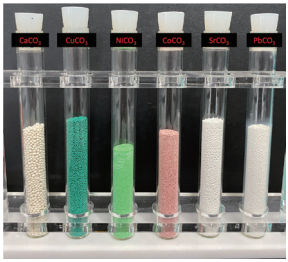
處理廢水中污染物離子的流體化床均質結晶方法及其設備

Fluidized bed homogeneous crystallization method and equipment for treating pollutant ions in wastewater

Patent No：(R.O.C. 優先) 專利申請案號：111137701 號
專利權人：國立中興大學 / National Chung Hsing University
發明人：盧明俊 / LU, MING-CHUN







專利技術介紹：

本程序適於水中金屬及非金屬離子回收，本發明之創新處除均質結晶外，另有晶種迴流及處理水再提升功能，因此整體處理回收程序無污泥產生，回收率近 100 %，同時由於結晶槽所流出之處理廢水再提昇，因此，處理水品質可達回收再利用之標準，達到零排放之目的。本發明所獲得結晶物純度高於 99.5 % 以上，可回收做為原料出售，沒有處理後續有害廢棄污泥之問題。即使不回收當做廢棄物處理，也因為含水量低 (<5%)，相對於傳統沉澱法所獲得之污泥，即使是在壓濾脫水後，含水量仍達 70 % 左右，所以處理費只有原來的三分之一，節省鉅額污泥處理費。同樣的優點也會出現在含陰離子 (例如磷酸根、硫酸根、草酸根、硫離子、銨離子及氟離子等等) 廢水處理上。

Patented technology introduction:

This process is suitable for the recovery of metal and non-metal ions in water. In addition to homogeneous crystallization, the innovation of this invention also has the functions of reflux and treated water upgrading. Therefore, the overall treatment and recovery process does not produce sludge, and the recovery ratio is nearly 100%. At the same time, because the treated wastewater flowing out of the crystallization tank is further improved, the quality of the treated water can meet the standards for recycling and reuse, achieving the purpose of zero discharge. The purity of the crystals obtained by the present invention is higher than 99.5%, can be recycled and sold as raw materials. It is unnecessary to have the subsequent treatment of harmful waste sludge. Even if it is not recycled and treated as waste, the treatment fee for the crystals is only one-third for the sludge, saving huge sludge treatment fees.

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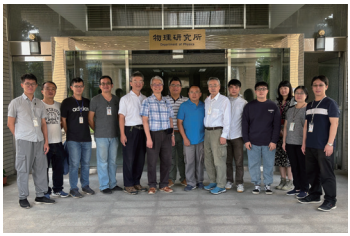
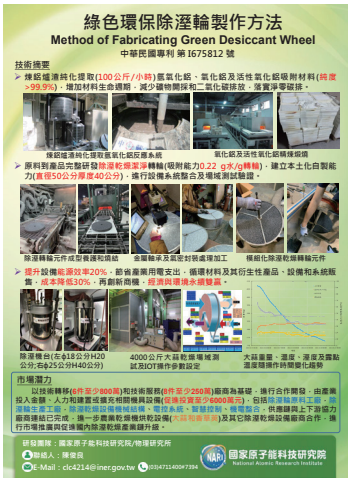
專利技術名稱

綠色環保除溼輪製作方法

Method of Fabrication Green Desiccant Wheel

Patent No：(R.O.C. 優先) I675812
專利權人：國家原子能科技研究院 / NATIONAL ATOMIC RESEARCH INSTITUTE
發明人：楊昇府、王多美、徐啟振、李恆毅 / Sheng-Fu Yang / To-Mei Wang / Chi-Tzeng Hsu / Heng-Yi Li





專利技術介紹：

本專利技術開發綠色製程自煉鋁產業廢棄物提取鋁元素，製作成氫氧化鋁原料，輔以電漿精煉生產活性氧化鋁及氧化鋁，減少礦物開採，增加材料生命週期，落實循環經濟及節能減碳。循環再生氫氧化鋁、活性氧化鋁及氧化鋁純度 ≥99.9%，除了可以直接販售外，並可依用途以專利技術進行加工，製作成節能吸附材料、環保除溼輪和蓄熱元件，綠色環保除溼輪系統整合乾燥除濕潔淨設備已經驗證可行，目前正在開發揮發性有機物吸脫附濃縮處理系統，有望可應用於空汙防制領域。此技術解決事業廢棄物處理難題，產業及人民皆有感，材料及其衍生性產品、設備和系統販售，降低成本，再創新商機。

Patented technology introduction:

The patent technology develops a process for extracting aluminum elements from waste in the aluminum industry, producing aluminum hydroxide, complemented by plasma refining to produce activated alumina or alumina. It reduces mineral extraction, extends material life cycles, and implements a circular economy and energy conservation to reduce carbon emissions. The purity of recycled products exceed 99.9%. They can not only be directly sold but also be processed for specific applications using patented technology to create energy-efficient adsorbents, eco-friendly dehumidification wheels, and heat storage components. The integrated green and eco-friendly dehumidification wheel system has been proven feasible in clean equipment. Currently, a volatile organic compound adsorption and desorption concentration treatment system is under development, with potential applications in the field of air pollution control. This technology addresses the challenge of industrial waste treatment, benefiting both industries and the public. Materials and their derivative products, equipment, and systems are available for sale, reducing costs and creating new business opportunities.

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專利技術名稱

管線內部清潔機器人
IN-TUBE CLEANING ROBOT

Patent No：(R.O.C. 優先) I805920
專利權人：正修學校財團法人正修科技大學 / CHENG SHIU UNIVERSITY
發明人：張法憲、許仕 / Fa-Shian Chang / Shi Xu

專利技術介紹：

本發明係為一種管線內部清潔機器人，其組成包括一載具本體與一偵查清潔模組。在偵查清潔模組中有一個鏡頭與感測器的偵查裝置與裝置有管線所需要的清潔裝置。本發明可以在水平面管線或垂直管線中運行。前述載具本體皆可預先搭載前述偵查裝置以進行管線之檢測，尋找需進行加強清潔之位置並記錄其坐標位置。操作人員可以依照任務需要更換為清潔裝置，利用該清潔裝置之即時影像監控定位清潔功能與創新之旋轉刷毛裝置以進行管線特定位置之清潔操作，達到精準定位清潔之目的。此外，具備可變升降調整運動機構、多功能工具模組化設計，適應不同管徑應用，具備提升工作效能、確保品質安全、高安全性、高精確性與低成本之工程方法，提升工程技術與品質。

Patented technology introduction:

This invention is for an internal pipeline cleaning robot, consisting of a vehicle body and an inspection-cleaning module. Within the inspection-cleaning module, there is a detection device with a camera and sensors, as well as a cleaning apparatus designed for pipeline cleaning. This invention can operate in both horizontal and vertical pipelines.

Furthermore, it features an adjustable lifting and lowering motion mechanism, a modular design for multifunctional tools, and adaptability to various pipeline diameters. It possesses an engineering approach that enhances work efficiency, ensures quality and safety, offers high security, high precision, and low-cost options, ultimately advancing engineering technology and quality.

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專利技術名稱

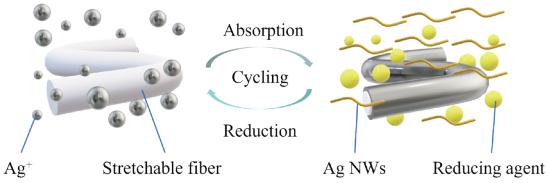
彈性導電纖維的製備方法及彈性導電纖維

Method of Preparing Flexible Conductive Fibers and Flexible Conductive Fibers

Patent No：(R.O.C. 優先) I878871
專利權人：南臺學校財團法人南臺科技大學 / Southern Taiwan University of Science and Technology
發明人：周盈年、洪聯強 / Chou Ying-Nien / Hung Lien-Chung

專利技術介紹：

穿戴電子設備是快速興起的研究領域，適用於各種應用，如個人化的健康監測、軟體機器人和人體運動檢測。本技術開發可應用在纖維應變傳感器的材料，使用非電鍍化學鍍層將金屬奈米顆粒沉積在表面，可應用於複雜的基材和幾何形狀。銀奈米線是受到廣泛關注的一維銀奈米結構材料，具有優異的光電性能、熱性能和機械性能。不僅具有一維材料的特性，還擁有高電導率（6.39 S/m）和優異的熱導率（429 W/(m·K)）。以原位聚合改質方法，包覆銀奈米線並固定在導電層中，以新型可拉伸和導電的銀奈米粒子 / 聚氨酯 (Ag NPs/PU) 並提出 Ag NPs/PU 的可逆導電性機制，具有的低初始電阻、寬廣的應變傳感範圍、高靈敏度、並且對重複拉伸具有高穩定性（1000 次的循環），可有效應用在各種紡織品。



Patented technology introduction:

Wearable electronic devices are a rapidly emerging research field with various applications, such as personalized health monitoring, soft robotics, and human motion detection. This technique develops a material for fiber strain sensors, using electroless chemical plating to deposit metal nanoparticles on the surface, which can be applied to complex substrates and geometries. Silver nanowires are a one-dimensional silver nanostructure material with excellent optoelectronic, thermal, and mechanical properties. They have not only the characteristics of one-dimensional materials, but also high conductivity (6.39 S/m) and excellent thermal conductivity (429 W/(m·K)). By using an in situ polymerization modification method, the silver nanowires are coated and fixed in the conductive layer. With a novel stretchable and conductive silver nanoparticle/polyurethane (Ag NPs/PU) and a reversible conductivity mechanism of Ag NPs/PU, they have low initial resistance, wide strain sensing range, high sensitivity, and high stability for repeated stretching (1000 cycles), which can be effectively applied to various textiles.

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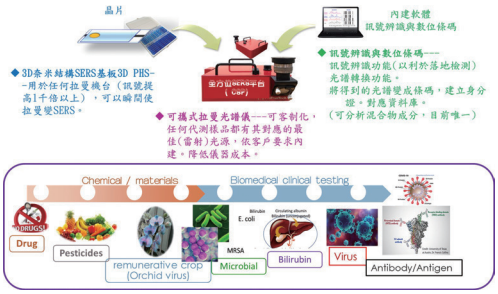
專利技術名稱

增強訊號之結構及其製作方法

Signal Enhancement Structure and Manufacturing Method Thereof

Patent No：(R.O.C. 優先) 發明第 I750718 號
專利權人：國立中興大學、佐信科技有限公司 / NATIONAL CHUNG HSING UNIVERSITY、
PROTRUSTECH CO., LTD
發明人：張健忠、黃俊達 / Chien-Chung Chang / Chun-Ta Huang



專利技術介紹：

團隊設計一個具有三維電漿熱點 3D-PHS 的奈米晶片。此晶片可同時增強待測物的拉曼訊號至 1000 倍以上的感度。並且具有以下優勢：(1) 無須樣品前處理、不需破壞樣品 (2) 樣品用量極少 (20ul) (3) 檢測時間極短 (< 5min)；(4) 生醫檢測無須抗體 (antibody-free)；(4) 晶片正常條件與環境可以保超過 80 天；(5) 任何拉曼光譜儀皆可使用。目前已成功應用於兩大檢測項目：農業檢測（農藥、蘭花病毒）及生醫檢測（膽紅素、癌細胞、病毒、DNA、抗體及抗原以及冠狀病毒）等。最近更完成 Covid-19 antibody /antigen 的檢測。結合與佐信科技公司共同研發之可攜式拉曼光譜儀，配合以 AI 方式建立的條碼與資料庫，結合成全方位 SERS 偵測平台 CSDP。其可以加速快篩的應用效率。儀器輕便可攜的特性可將儀器帶入實際場域，因此無須將樣品帶回實驗室即可進行檢測。

Patented technology introduction:

We developed a three-dimensional plasmonic hot-spot rich (3D-PHS) nanochip, which was constructed based on a random crossed-wire silver nanowire woodpile structure. The advantages of 3D-RCW are as follows: (1) No sample pretreatment and no need to destroy the sample; (2) The amount of sample used is very small (20 μL); (3) The detection time is extremely short (< 5min); (4) Antibody-free for biomedical detection; (4) The chip can be kept for more than 80 days under normal condition and environment; (5) Not limited by hardware devices (any Raman spectrometer can be used). Furthermore, we have also developed a portable spectrometer with ProTrusTech (PPT) company to fit CSDP and eventually, it becomes a powerful rapid screening detection system. At this stage, CSDP has been successfully applied to two items: agriculture (pesticides, orchid virus) and biomedical testing (drugs, bilirubin, bacteria, cancer cells, antibodies and antigens, and coronaviruses). Among them, pesticides have reached the farm test; bilirubin has successfully cooperated with NTU Hospital and clinical data collection. Covid-19 virus and antibody information has also been established. Such biosensing technology can be used by healthcare units for effective Point of Care Testing (POCT).

國立中興大學、佐信科技有限公司 /
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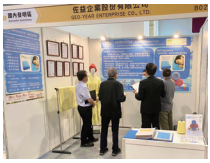
專利技術名稱

環保花式紗及其製作方法

Recycled Fancy Yarn and Manufacturing Method Thereof

Patent No：(R.O.C. 優先) I 695100
專利權人：王彰慶 / Wang, Chang-Ching
發明人：王彰慶 / Wang, Chang-Ching



專利技術介紹：

本專利「環保花式紗及其製作方法」是以「永續時尚」為理念，在環保永續的前提下，設計兼具美觀時尚與舒柔觸感的紗線原料，可廣泛應用於毛衣、帽、毛毯、圍巾等針織品，以取代高汙染的「快時尚 / 一次性時尚」紡織品。本產品主要具備以下特點：

- 專利紗線結構，改良傳統紡紗方式，有效提高飾線佔比
- 立體結構設計，使織物柔軟、保暖且透氣不悶熱
- 寶特瓶回收原料，具有韌性佳、輕量、耐水、耐油特點
- 紗線呈現豐厚柔軟手感，提升紡織品立體時尚感與耐用度
- 可廣泛應用於個人、家居、戶外、嬰幼兒等紡織品
- 本紗線採用環保回收原料符合全球回收系統標準認證
- 本產品檢測通過國際紡織品最高等級安全要求
- 本設計取得德國綠色產品獎、經濟部中小企業創新研究獎等殊榮

Patented technology introduction:

The patent "Recycled Fancy Yarn and Manufacturing Method Thereof" is designed with the concept of "sustainable fashion," aiming to create a type of yarn material that is both aesthetically pleasing and fashionable, while offering a soft, comfortable textile, all while prioritizing environmental sustainability.

The yarn can be widely used in knitting products such as sweaters, hats, blankets, scarves, etc., to replace high-pollution "fast fashion/disposable fashion" textiles. The key features of this patent are listed below.

- Patent yarn structure, improving the traditional spinning method, effectively increasing the decorative thread ratio.
- Three-dimensional design, making the fabric soft, warm, and breathable without feeling stuffy.
- Made from recycled PET bottles, it has excellent toughness, is lightweight, and is water and oil-resistant.
- The yarn exhibits a rich, soft texture, enhancing the three-dimensional fashion and durability of textiles.
- The yarn can be widely used in personal, home-use, outdoor, baby, and toddler textiles.
- This yarn is made from recycled materials and complies with global recycling system standards (GRS).
- This product has been tested to meet the highest international textile safety requirements.
- This design has won awards such as the German Green Product Award and the Taiwan SMEs Innovation Award.

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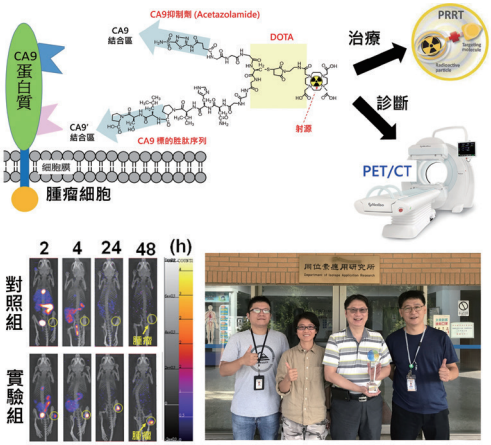
專利技術名稱

雙靶向碳酸酐酶第九型複合物及造影劑

Dual-targeted carbonic anhydrase ix complex and a contrast agent thereof

Patent No：(R.O.C. 優先) I765195
專利權人：國家原子能科技研究院 / NATIONAL ATOMIC RESEARCH INSTITUTE
發明人：官孝勳、羅彩月、廖澤蓉、彭正良、林昆諒 / Guan, Siao-Syun / Luo, Tsai-Yueh / Liao, Tse-Zung / Peng, Cheng-Liang / Lin, Kun-Liang



專利技術介紹：

腫瘤缺氧是導致放射療法或化學療法效果不佳的重要因素。若醫師能正確的診斷或評估腫瘤缺氧狀態，就能執行對應的治療策略，在黃金治療時期控制患者病情惡化，亦能避免後續照護的社會成本。因此，本專利設計以腫瘤缺氧生物標記 (碳酸酐酶第九型蛋白質) 為標的位置的探針，並攜帶放射性核種，作為腫瘤缺氧造影診斷之核醫藥物使用，使醫師能透過影像立即辨識腫瘤缺氧情形與位置，達到精準醫學之目的。本專利改善目前腫瘤缺氧造影劑的缺點，包括提升對腫瘤缺氧的親和力與辨識力、減少肝臟吸收、不引起免疫反應，診斷效果已優於現有黃金標準藥物。

Patented technology introduction:

Tumor hypoxia is an essential factor contributing to the ineffectiveness of radiation therapy or chemotherapy. Suppose a physician can correctly diagnose or assess the hypoxic status of a tumor. In that case, he or she can implement appropriate therapeutic strategies to control the deterioration of the patient's condition during the golden treatment period and avoid the social cost of follow-up care. Therefore, this patent design uses a tumor hypoxia biomarker (carbonic anhydrase type IX protein) as the target location of the probe and carries radioactive nuclei, which can be used as a nuclear medicine drug for tumor hypoxia diagnosis so that doctors can immediately identify the tumor hypoxia situation and location through the image, and thus achieve the purpose of precision medicine. This patent improves the shortcomings of the current tumor hypoxia contrast agents, including improving the affinity and recognition of tumor hypoxia, reducing liver absorption, and not inducing immune response. The diagnostic effect is already better than the existing gold standard drugs.

國家原子能科技研究院 / National Atomic Research Institute

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