# 『淨零新創主題館』活動辦法

**附件 4**

## 參選說明表-大專院校

填表日期：113 年 11 月 7 日 (*為必填欄位)

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| **產品或服務名稱** | *(中文)<br>1. 動態行為評估系統<br>2. 注意力不足過動症評估方法、系統、內儲程式之電腦程式產品及內儲程式之電腦可讀取紀錄媒體 |
| | *(英文)<br>1. Objective Evaluation of Therapeutic Effects of ADHD Medication Evaluation Method for attention-deficit hyperactivity disorder, System, Computer Program Product with Stored Programs, and Computer Readable Medium with Stored Programs |
| **產品或服務創新介紹 (50%)** | *(中文)<br>1. 動態行為評估系統<br>目前注意力不集中併過動症(ADHD)主要以核心症狀的出現與否為診斷的標準；另外輔助以行為量表之填寫。但不論症狀的描述與量表之填寫，都會摻入許多主觀的因素，也因此診斷不客觀的問題，目前仍然難以解決。本發明結合陀螺儀與加速度計偵測器建置在手錶中配戴在 ADHD 兒童手上，將個案活動強度及頻率以科學化的數據呈現。並與正常兒童做比較，建立 ADHD 客觀的診斷及評估標準。<br>2. 注意力不足過動症評估方法、系統、內儲程式之電腦程式產品及內儲程式之電腦可讀取紀錄媒體 |

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| | 為了客觀且及時在診間診斷及評估 ADHD，團隊特別設計一個診療椅，診療椅的偵測器包括壓電材料與陀螺儀及加速度計，可即時計算受測者活動量的特徵值，作為 ADHD 的客觀評估工具。也有資料庫功能作為支援後續研究的資料管理。在看診期間智慧型診療椅持續記錄壓電材料與陀螺儀及加速度計數據，看診結束後使用者可以將記錄上傳到網路資料庫，被授權的人員可透過網路進行遠端的監視與分析。 |
| | *(英文)<br>1. Objective Evaluation of Therapeutic Effects of ADHD Medication<br>The diagnosis of ADHD is based on the core symptoms appearing in DSM-IV or V criteria. In addition to the criteria, some physicians use checklists to assist the diagnosis of ADHD. However, either symptoms or checklists are subjective, which leads to diagnostic problem. In this product, data from the gyroscope and accelerometer in a smart watch were used to analyze the movements of children with ADHD. The children with ADHD and controls wore the watches on their hands simultaneously in class and compared the data from recorders for analysis. This method can help us to establish a objective tool for diagnosis and evaluation of ADHD.<br><br>2. Evaluation Method for attention-deficit hyperactivity disorder, System, Computer Program Product with Stored Programs, and Computer Readable Medium with Stored Programs<br>For objectively and immediately diagnosing and evaluating patients with ADHD, we design a smart chair as a detector in the consulting room. The detectors of the smart chair include piezoelectric materials, gyroscopes and accelerometer. The characteristic value of the subject's activity can be calculated in real time as an objective assessment tool for ADHD. The system has database functions as data management to support follow-up research. During the consultation, the smart chair continuously records the piezoelectric material, gyroscope and accelerometer data. After the consultation, the user can upload the record to the network database, and authorized personnel can monitor and analyze it through the network. |
| **應用效益** | *(中文) |

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| **(30%)** | 1. 動態行為評估系統<br><br>本產品的最大特色，即在開發一穿戴式監測系統，連結受測者、家長、老師與醫師；個案在不妨礙平常的生活習慣即可記錄動作模式，並提供一客觀數據給相關人員。本產品已證實能區分 ADHD 兒童和正常兒童動作模式生物標記的差異，可進一步利用這樣的研究成果進行病童療效的評估。與過去單純使用臨床觀察比較起來，這樣的方法不僅較為客觀，能避免誤診或漏診的狀況。相信本產品的應用必能使 ADHD 兒童能有更科學與客觀的診斷與治療及療效追蹤，不但可避免治療先機被貽誤，提高有效治療機會，亦可避免無效藥物治療所造成的健保資源浪費。<br><br>2. 注意力不足過動症評估方法、系統、內儲程式之電腦程式產品及內儲程式之電腦可讀取紀錄媒體<br><br>本作品即時診斷功能在測試過程中不會給受測者帶來額外的設備和負擔，使儀器對受測者的干擾降到最低，可利用客觀數據連結受測者、家長、老師與醫師，避免人為評估主觀的誤差。而且本作品所建立的研究方法，可提供遠距照護與評估，減輕使用者重複往返醫療院所的負擔，提升健康照護的方便性及即時性。另外資料庫的建立，將可以提供未來兒童神經疾患病童的臨床應用，該系統可擴展到在數種兒童動作或行為異常的神經疾患上， 除 ADHD 外，如妥瑞氏症及腦性麻痺等動作障礙。早期且正確的診斷合併有效且客觀的評估，不但可避免治療先機被貽誤，提高有效治療機會，亦可避免無效藥 |

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| | 物治療所造成的健保資源浪費，進行有效率的用藥管理。 |
| | *(英文)<br><br>1. Objective Evaluation of Therapeutic Effects of ADHD Medication<br>The feature of this product is the development of a wearable monitoring system that connects subjects, parents, teachers and doctors. We can record movement patterns in patients with ADHD without interfering with their daily activities, and provide objective data. This product has been proven to be able to distinguish the differences of action patterns between ADHD and normal children, and such research results can be further used to evaluate the efficacy of treatment in children. Compared with the use of clinical observation, this method is not only objective, but also can avoid misdiagnosis. I believe that the application of this product will enable children with ADHD to have more scientific and objective diagnosis, treatment evaluation. It will not only prevent treatment opportunities from being delayed, increase the chance of effective treatment, but also avoid the waste of health care resources caused by ineffective drug treatment.<br><br>2. Evaluation Method for attention-deficit hyperactivity disorder, System, Computer Program Product with Stored Programs, and Computer Readable Medium with Stored Programs<br>The instant diagnosis function of this work will not bring additional equipment and burden to the test subject during the test process, so as to minimize the interference of the instrument to the test subject. Objective data can be used to connect subjects, parents, teachers and doctors; avoid subjective errors in human evaluation. In addition, the research case database established in this work reduces the burden of repeated trips to and from medical institutions for users, and improves the convenience and timeliness of health care. It will provide future clinical applications in children with neurological disorders. In addition to ADHD, the system can be extended to several neurological disorders in which children's movements or behaviors are abnormal, such as Tourette's disease and cerebral palsy. Not only can it avoid the delay of treatment opportunities, improve the chance of effective treatment, but also avoid the waste of health care resources caused by ineffective drug treatment and increase the efficiency of medication management. |
| **研發績效及國內外發表** | 我們所提出的方法可以客觀地分析 ADHD 兒童在學校及診間的活動情況，並用以診斷 ADHD。本團隊的研究成果已於近幾年發表多篇論文於國際知名期刊，亦獲 |

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<table>
<tr><td rowspan="2">成效<br>(20%)</td><td colspan="6">得兩個專利，並於 2021 年以此發明榮獲 18 屆國家新創獎於 2023 年榮獲新創精進獎。</td></tr>
<tr><td colspan="6">Our proposed method can objectively analyze the activities of children with ADHD at school and in the clinic and be used to diagnose ADHD. Our research results have been published in well-known international journals in recent years, and the results have also obtained two patents. In 2021, this invention won the 18th National Innovation Award and the Innovation and Excellence Award in 2023.</td></tr>
<tr><td rowspan="6">*符合 SDGs 永續發展目標</td><td></td><td>1.消除貧窮</td><td></td><td>2.終止飢餓</td><td></td><td>3.建康與社福</td></tr>
<tr><td></td><td>4.優質教育</td><td></td><td>5.性別平權</td><td></td><td>6.淨水與衛生</td></tr>
<tr><td></td><td>7.可負擔的潔淨能源</td><td></td><td>8.適合的工作及經濟成長</td><td></td><td>9.工業化、創新與基礎建設</td></tr>
<tr><td></td><td>10.減少不平等</td><td></td><td>11.永續城鄉</td><td></td><td>12.責任消費及生產</td></tr>
<tr><td></td><td>13.氣候行動</td><td></td><td>14.保育海洋生態</td><td></td><td>15.保育陸域生態</td></tr>
<tr><td></td><td>16.和平、正義及健全制度</td><td></td><td>17.多元夥伴關係</td><td></td><td></td></tr>
<tr><td rowspan="4">淨零十二項關鍵戰略</td><td></td><td>1.風能/光能</td><td></td><td>2.氫能</td><td></td><td>3.前瞻能源</td></tr>
<tr><td></td><td>4.電力系統與儲能</td><td></td><td>5.節能</td><td></td><td>6.碳捕捉利用及封存</td></tr>
<tr><td></td><td>7.運具電動化及無碳化</td><td></td><td>8.資源循環零廢棄</td><td></td><td>9.自然碳匯</td></tr>
<tr><td></td><td>10.淨零綠生活</td><td></td><td>11.綠色金融</td><td></td><td>12.公正轉型</td></tr>
<tr><td rowspan="2">研究團隊/單位</td><td colspan="6">本團隊為一跨領域團隊，團隊成員包含小兒神經科醫師(林龍昌教授及楊瑞成教授)與國立高雄科技大學資訊管理學系歐陽振森教授及義守大學電機工程學系吳榮慶教授，組成智慧醫療照護研究團隊。近幾年結合疾病生理學、臨床醫學與人工智慧的合作下，致力於癲癇、ADHD、偏頭痛(migraine)等小兒神經疾病患者之量化腦波(quantitative electroencephalography)與智慧化的動作分析在 ADHD 的研究，藉以提供臨床診斷、治療、預後等決策支援應用。相關研究成果已發表數十篇國際期刊與會議論文，並獲得多項專利。</td></tr>
<tr><td colspan="6">Our team is an interdisciplinary team. The team members include pediatric neurologists (Professor Lung-Chang Lin and Professor Rei-Cheng Yang), Professor Chen-Sen Ouyang of the Department of Information Management of the National Kaohsiung University of Science and Technology, and Professor Rong-Ching Wu of the Department of Electrical Engineering of I-Shou University to form a smart medical care research team. In recent years, through the integration of physiology, clinical medicine and artificial intelligence, we have been committed to the study of quantitative electroencephalography and intelligent movement analysis in patients with epilepsy, ADHD, migraine and other</td></tr>
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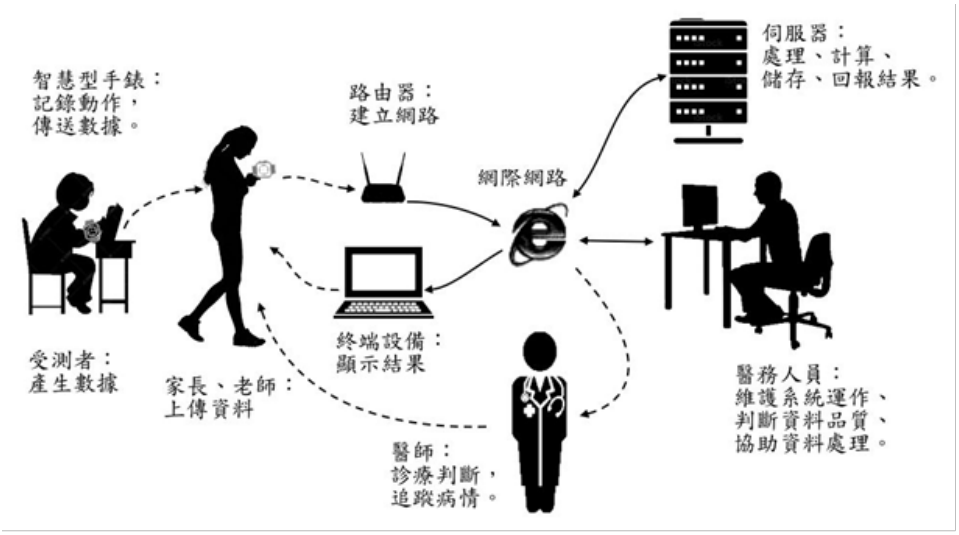
| | pediatric neurological diseases, to provide decision support applications such as clinical diagnosis, treatment, and prognosis prediction. Relevant research results have been published in dozens of international journals and conference papers, and a number of patents have been obtained. |
| ***學校/研究單位 logo** | |
| **佐證圖片 或影片** | 1. 動態行為評估系統<br>  <br><br>穿戴式監測系統 |

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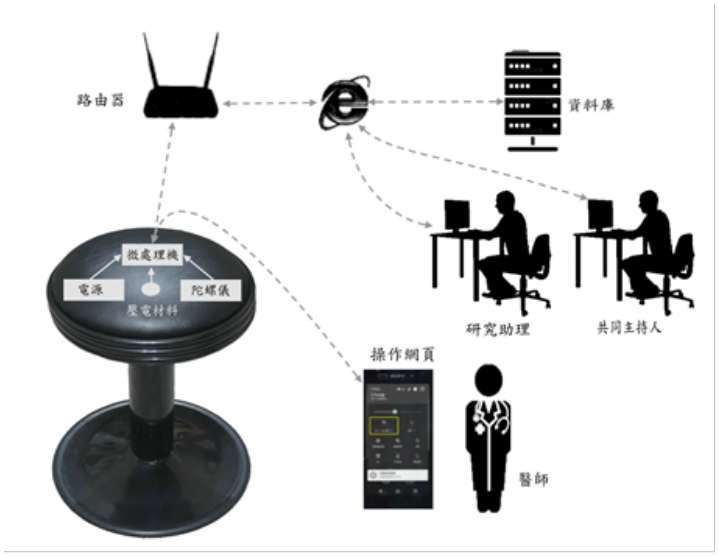
2. 注意力不足過動症評估方法、系統、內儲程式之電腦程式產品及內儲程式之電腦可讀取紀錄媒體




智慧診療持系統架構

**# 附註：表格大小不足，請自動調整欄位大小，以便利於撰**