



漸凍病友彼此交流互動
Interaction between ALS patients

實踐大學與瑞典 Tobii 合作開發「智慧溝通眼鏡」 造福漸凍病友落實 USR

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漸凍病友的一句話，意外促成一樁美事。實踐大學於 2022 年 9 月 29 日與全球知名眼動追蹤領導廠商瑞典 Tobii 公司簽署「教育部大學社會責任實踐計畫：漸凍病友科技生活設計」合作備忘錄。由 Tobii 公司協助實踐大學設計團隊，進行「面對面溝通智慧眼鏡設計」的後續研發與商品化，未來不僅能落實大學社會責任(USR)，更能造福漸凍病友。簽約儀式與會人士有中華民國運動神經元疾病病友協會(漸凍人協會)沈心慧理事長、台灣聽力語言學會蕭麗君常務理事、國立臺北大學通訊工程學系語音暨多媒體訊號處理實驗室江振宇副教授等貴賓，共同見證此次別具意義的跨領域產學合作案。

在簽約儀式中，實踐大學校長丁斌首表示，自創校以來，即以生活科學為發展重點，近年設計學院更名列全世界最佳設計學校前 30 名。此次實踐大學設計團隊結合設計與新科技，提出漸凍病友的智慧溝通設計，這也是大學善盡社會責任的重要案例。Tobii 公司總經理蘇亦堂表示，Tobii 公司很樂意以善盡社會企業責任的角度，協助實踐大學設計團隊進行漸凍人智慧溝通眼鏡技術的研發與商品化的可能性。

2022 年 9 月初，在漸凍人協會舉辦的「25 週年數位藝術展」中，實踐大學盧禎慧副教授設計團隊提出「面對面溝通智慧眼鏡設計」的概念，引發許多迴響，並接到不少漸凍病友的購買詢問。漸凍人協會理事長沈心慧表示，曾經有許多很好的產學合作成果，但可惜沒有機緣將設計理念與想法商品化，讓病友無法順暢的跟外界溝通。獲知這樣的訊息後，實踐大學設計團隊決定做得更多，期能進一步將設計概念轉化為商品。

這支設計團隊決定挑戰「不可能的任務」，進而向 Tobii 公司尋求合作的機會。Tobii 公司是瑞典的股票掛牌公司，更是研發眼動技術領域的翹楚，其客戶包含全球的 VR 大廠，國內鴻海、廣達在內電子五哥的產品也都和 Tobii 公司接洽導入相關技術。

實踐大學盧禎慧副教授指出，為提升學術與產業的接軌，已連續超過六年與 Tobii 公司密切合作，主要由陳儀樺經理協助學生將眼動技術結合至不同主題的設計研究，並提供技術知識與數據分析能量，讓學生能更快速體驗眼動技術在產業中的應用。實踐大學工業產品設計學系是臺灣目前唯一將眼動儀設備提供給學生上課學習使用的設計學系，未來 Tobii 公司將以成果發表工作坊的形式，透過產業實際需求回饋至學生的設計成果，期能強化學生就業競爭力。



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1. 丁斌首校長於簽約儀式致詞
Ting Pin-Shou (丁斌首), President of Shih Chien University, gave his remarks at the signing ceremony.
2. 工作人員介紹產品
Staff introduced products to visitors.
3. 「我思故我在」BCI 智慧溝通產品
“I think, therefore I am” BCI smart communication product



(左起)漸凍人協會沈心慧理事長、台灣聽語學會蕭麗君常務理事、實踐大學丁斌首校長、國立臺北大學江振宇副教授及 Tobii 公司蘇亦堂總經理合影。

(From left to right) Taiwan Motor Neuron Disease Association President Shen Hsin-Hui (沈心慧), Taiwan Speech-Language-Hearing Association Executive Director Hsiao Li-Chun (蕭麗君), Shih Chien University President Ting Pin-Shou, Associate Professor Chiang Chen-Yu (江振宇) at National Taipei University and Tobii General Manager Tipu Sultan (蘇亦堂).

繼 9 月初在剝皮寮與漸凍人協會合作的「25 週年數位藝術展」，盧禎慧副教授設計團隊於 2022 年 9 月 27 日至 10 月 1 日在實踐大學敏初廳推出「領愛飛翔續集 — 漸凍人科技設計展」。此展覽的主要訴求是以成熟的技術及前瞻的科研結合設計力，為漸凍病友提供智慧溝通的設計提案。

盧禎慧副教授的設計團隊規劃出三種不同系列的高科技溝通輔具設計概念，包括：(一)「面對面智慧溝通眼鏡」：透過眼動追蹤技術，操控智慧眼鏡，讓病友更方便自如的實現面對面溝通，感受交流的溫度。(二)「我思故我在(COGITO)，BCI 智慧溝通輔具」：透過血管式植入腦部晶片，以腦波分辨情緒與意念寫字的技術，並連接病友的顯示裝置進行傳達，讓閉鎖

期病友也可以表達想法與心情。(三)「語音及表情重現溝通輔助建置系統」：此為一套語音與表情個人化資產保存的服務設計，專為發病初期病友所設計之語音及臉部保存的服務計畫，病友可由專人引導，在互動情境下錄製聲音與保存面部特徵，再使用 AI 語音學習及 IR 臉部捕捉技術，重現聲音與表情，供日後需要時使用。這三款設計是經由團隊成員蘇宸緯、徐曼閣、陳熾緯及蘇希，在與漸凍病友及家屬密切互動與訪談後，提出符合病友溝通需求的設計概念。這次漸凍人科技設計展獲得媒體的熱烈報導與相關企業的詢問，團隊成員希望未來可以將設計概念實現並商品化，以提供漸凍病友透過高科技智慧溝通輔具的協助，進而擁有更佳的生活品質。



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1. 台灣聽語學會常務理事蕭麗君與漸凍人協會前理事林詠沂對談
Hsiao Li-Chun, Executive Director of Taiwan Speech-Language-Hearing Association, talked with Lin Yong-Yi (林詠沂), former Board Director of Taiwan Motor Neuron Disease Association.

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2. (左起)Tobii 公司蘇亦堂總經理、丁斌首校長與 NVIDIA 台灣區鄭亦為協理交換意見。
(From left to right) Tobii General Manager Tipu Sultan (蘇亦堂), Shih Chien University President Ting Pin-Shou and NVIDIA Taiwan Senior Sales Manager Alex Chu (鄭亦為) exchanged ideas.

University Social Responsibility: Shih Chien University Joins Hands with Tobii to Develop Smart Glasses for ALS Patients

Lu Chen-Hui (盧禎慧), Associate Professor in the Department of Industrial Design
Su Chen-Wei (蘇宸緯), graduate student in the Department of Industrial Design

A comment by an ALS (amyotrophic lateral sclerosis) patient has fortuitously led to a wonderful collaboration. On September 29, 2022, Shih Chien University signed a memorandum of understanding with Tobii, a Swedish company that develops and sells products in eye-tracking, on a university social responsibility (USR) program that aims to launch well-designed products for ALS patients. Tobii, the global leader in eye-tracking products, will support Shih Chien's design team to develop and commercialize the design of smart glasses. The program is a demonstration

of Shih Chien's dedication to USR and its aim to support ALS patients. The President of Taiwan Motor Neuron Disease Association Shen Hsin-Hui (沈心慧), Executive Director of Taiwan Speech-Language-Hearing Association Hsiao Li-Chun (蕭麗君), and Associate Professor Chiang Chen-Yu (江振宇) in the Department of Communication Engineering at National Taipei University are some of the guests attending the ceremony to witness this fantastic cross-disciplinary collaboration between industry and academia.



合作備忘錄簽約儀式
MOU signing ceremony

At the ceremony, the President of Shih Chien University Ting Pin-Shou (丁斌首) said the university has been devoted to offering practical subjects since its establishment. In recent years, its College of Design has been ranked as one of the world's top 30 design schools. This time, Shih Chien's design team is leveraging the power of design and new technology to develop a smart communication device for ALS patients. It has also become an important collaboration that demonstrates Shih Chien's devotion to CSR. Tobii General Manager Tipu Sultan (蘇亦堂) said the company is happy to fulfill its corporate social responsibility by supporting Shih Chien's design team to develop smart glasses for ALS patients and to commercialize the design.



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| 1 | 1. 「ISSUE」面對面眼控溝通眼鏡產品
ISSUE: the face-to-face eyewear product |
| 2 | 2. 沉浸式體驗病友故事
An immersive experience: listening to the stories of ALS patients |



語音與表情重現的溝通輔助建置系統影片
A demo video of the voice and expression generator system



語音與表情重現的溝通輔助建置系統概念介紹

Introduction of the voice and expression generator system

In early September this year, at the 25th anniversary digital art exhibition organized by Taiwan Motor Neuron Disease Association, Professor Lu Chen-Hui (盧禎慧) and her team proposed the concept of smart glasses for ALS patients. The idea was well received and many patients contacted the team about how they could purchase the product. President of the association Shen Hsin-Hui said there had been many brilliant collaborations between the industry and academia but none of them were successfully turned into products for ALS patients. Having learned about the fate of previous inventions, Shih Chien's design team are devoted to making their design commercially viable.

The team decided to challenge what was seen an impossible mission and approached Tobii for a chance to collaborate on the project. A listed Swedish company, Tobii is a global leader in eye-tracking technology

and its clients include many of the big virtual reality companies around the world. Large Taiwanese companies, including Foxconn Technology Group and Quanta Computer, have also contacted Tobii to use its technology in their products.

Professor Lu pointed out that, in a bid to connect academic learning with industry, her team has worked closely with Tobii for more than six years. Eve Chen (陳儀樺), manager at Tobii, has helped students discover different design research topics on eye-tracking technology and provides know-how and data analysis so students can more quickly see the application of the technology. Shih Chien's Department of Industrial Design is the only such department in Taiwan that provides eye-tracking equipment in the classroom. Tobii plans to organize workshops for students to demonstrate their design results. The purpose of the workshops is to provide feedback from

the perspective of the industry and increase students' competitive edge in the job market.

In early September, Professor Lu's research team organized the 25th anniversary digital art exhibition with Taiwan Motor Neuron Disease Association at Bopiliao Historic Block. From September 27 to October 1, 2022, Professor Lu and her research team organized another exhibition on ALS technology at Shih Chien University. The purpose of the exhibition was to propose design solutions that leverage smart technology to help ALS patients communicate based on mature technology and research.

Professor Lu's research team has designed three different series using assistive technology. First, the smart glasses: the smart glasses use eye-tracking technology to help ALS patients more easily have face-to-face communication and experience the warmth and joy of real-life interaction. Second, the "I think, therefore I am" (COGITO) BCI smart assistive device: by implanting a chip into a blood vessel with

the technology to read the emotions and thoughts of patients, the device connects the results to a display, allowing patients to express their emotions and thoughts. Third, the voice and expression generator system: a system to preserve the voices and expressions of patients with an early diagnosis. With support and guidance, ALS patients can have their voices and facial expressions recorded in an interactive scenario. AI voice learning and IR face recognition technologies are then used to reproduce voices and expressions for later use. The concepts of these designs are the results of close discussion by team members Hsu Man-Ko (徐曼閣), Chen Chih-Wei (陳熾緯) and Su Hsi (蘇希) with the families of ALS patients, with an aim to develop designs that meet the communication needs of patients. The ALS technology design exhibition received wide media coverage and many companies have approached the team for more information. The team hopes to make the designs commercially viable in the future, so ALS patients will enjoy better life quality with the support of assistive technology.



漸凍人協會沈心慧理事長與病友合影
President of Taiwan Motor Neuron Disease Association Shen Hsin-Hui had photos taken with ALS patients.