附件三

出國報告（出國類別：參加國際研討會）

2017 IEEE International Conference on Applied System Innovation (ICASI2017)

服務機關：國立虎尾科技大學機械與電腦輔助工程系、光電工程系
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派赴國家：日本
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摘要

本人很榮幸與工學院林盛勇院長參與此次在日本北海道札幌市舉行之 2017 IEEE International Conference on Applied System Innovation (ICASI2017(國際研討會，除擔任大會 Program Committee 委員會委員，並與林院長分別在會議中發表研究成果。

本次研討會領域包含有訊息技術、創新設計、通訊工程與科學、工業設計、創新設計、應用數學、計算科學、設計原理、文化與創新研究、電子與電機工程、機械與自動化工程、綠能技術與建築工程、材料科學等相關研究領域，共分為 29 個會議(包含 14 一般會議及 15 個邀請會議)超過 730 篇文章發表，包含邀請報告、口頭報告與海報張貼等發表方式，此次會議發表文章將收錄於 IEEE ICASI2017 論文集，且部分優秀文章將刊載於 SCI 期刊中，提供本人與相關領域傑出學者及專家學習與意見交流的機會，對於提升本人學術研究能量與國際視野助益甚大。

目　次

目的

2017 IEEE International Conference on Applied System Innovation 國際研討會舉辦地點在日本札幌市，本次參加學者除了有台灣相當知名的學者教授(陳英忠教授、李清庭教授、張守進教授等)，另有東道主日本、新加坡、韓國、英國、美國、澳大利亞以及中國等國家的學者一同參與本研討會。大會並特別邀請 Mo Li 教授、Ajit Khosla、Tsuyoshi Yamamoto 教授、Fatih TAŞA 教授以及 Stephen D. Prior 博士分別進行主題演講與邀請演講。各報告者皆簡報目前的研究內容成果，內容豐富充實，本人及林院長亦各有發表一篇文章。藉由此次會議不僅有助於提升本校的研發能量上能見度，藉由與與會專家學者的學術交流，更可以開展本人與院長的視野並提供與先進團隊合作研究的機會。

過程

本人於5月12日由高雄小港國際機場搭乘華航班機，於日本當地時間晚上約6點15分抵達日本北海道新千歲國際機場，經過機場通關程序，搭乘主辦單位貼心安排與會專家學者搭乘專車前往會議地點札幌艾米西亞飯店。5月13日一大早起床用完早餐並打理完畢後，熟悉會場周邊交通環境並用過午餐後後，本人旋即至研討會櫃檯提早辦理會議註冊手續。

5 月 14 一大早在用完飯店早餐後，根據大會所提供的會議手冊資料，本人與院長於上午九時許參加研討會開幕式，儀式當中首先由會議主席—台灣成功大學張守進教授致詞並宣讀歡迎辭，由台灣知識創新學會秘書長致詞後並由學會會長會長—閔庭輝教授致詞並頒發感謝狀，緊接著本人參加由大會精心邀請的主題演講與邀請演講，分別為 Georgia Institute of Technolog 的 Mo Li 教授演講“Relevant length scales せ size effect, and nanomechanics of metallic glasses”主題，緊接著，大會安排由目前在日本 Yamagata University 的客座教授 Ajit Khosla 教授發表 "Fabrication and Application of Nano-particle Doped Nano-Micro-Patternable Multi-Functional Polymers"演講，以及最後一位服務於 Graduate School of Information Science and Technology 的 Tsuyoshi Yamanoto 教授發表“Understanding Big Data Through Visualization”專題演講。 當天下午本人與院長分別參與編號 O01、O09、O06 與 O15 sessions 的論文報告以及現場的海報論文 ，並在當天下午聆聽大會安排的演講，接著，於晚間六時許參加大會所舉辦的晚宴，藉此與來自各地的專家學者進行意見交流。

而在會議接下來的幾天，隨著大會議程安排流程，計畫主持人除了繼續聆聽大會安排的報告內容外，並張貼海報外，也與與會學者進行更深入的訪談與交流，除了針對學門專長領域的專家學者討論相關研究內容外，也藉由訪談了解到跨領域(如資訊、機械工程以及多媒體設計等)學者專家的研究態度與精神，觀察到不同領域學者對於事物的看法與研發態度，更重要的是學習到在不同領域佼佼者成功的方法，此外，在會議舉行的空檔，計畫主持人亦搭乘交通工具參觀北海道札幌附近的風華。

經過六天五夜研討會的學術以札幌市近郊文化與風景的洗禮後，本人於 2017 年 05 月 17 日下午 19:15 分，計畫主持人帶著滿足而依依不捨的心情前往新千歲國際機場，搭乘中華航空於當天晚間 22:50 分返抵高雄小港機場。

心得及建議

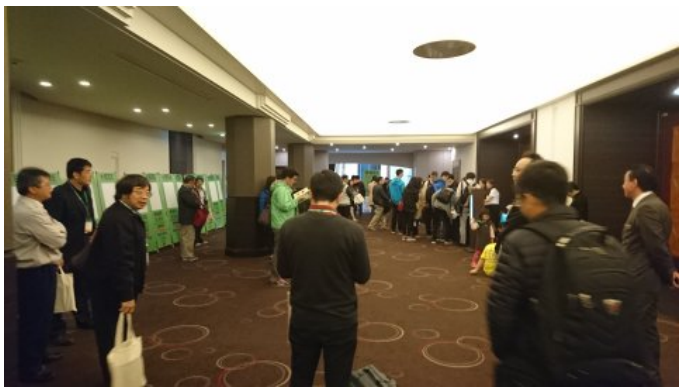
本次參加在日本北海道所舉行的 IEEE ICASI2017 國際研討會，會議主題涵跨電子、電機、光電、材料、機械、設計以及能源等跨領域主題，可以提供計畫主持人與相關領域專家意見溝通的機會，在開會期間除了可以與相關領域研究先進學習並討論研究成果外，藉由大會安排的各個專題與會議演講，更可以提供本人深入了解其他相關領域的研究內容與方向，提供本人進一步從事跨領域研究的動機與可行性，此外，大會精心安排的接送工具與行程，更可以讓本人在無後顧之憂的環境下，充分與與會學者專家先進進行深入的探討與學習，不僅有助於充實本人研究能量，更可以提供本人對於未來研究方向的啟發。且會議結合 IEEE Tainan Section Sensors Council 更有助於提升本研討會的國際能見度，建議可依此模式成為 IEEE 每年重要的研討指標之一。

會議照片

大會開幕會場

與大會海報合影

研討會一隅及邀請演講教授風采



附錄一攜回資料名稱及封面

附錄：攜回資料名稱及封面

附錄--發表文章之摘要及全文

Effect of Various Assisted Machining Technique Applications on Cutting Performance of Quartz Glass Milling

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Keywords: quartz glass, biaxial ultrasonically assisted, uniaxial ultrasonically assisted, cutting performance

Abstract--The three stage experiments including without assistance, uniaxial ultrasonically assisted and biaxial ultrasonically assisted machining systems on quartz glass milling were constructed in this study in order to verify the assisted effect on cutting performance and to compare the merit and limitations among them. First of all, the milling experiment without assistance was performed to investigate the variations of cutting performance. Next, uniaxial ultrasonically assisted system (y direction oscillation) and a biaxial ultrasonically assisted system with simultaneous dual-axis oscillations (x and y directions) were subsequently introduced at the second to the third stage experiments, respectively. At each stage experiment, the effects of process parameters on the variations of the machined surface quality and cutting-tool wear are investigated. It is expected that the machinability of this high brittle material can be promoted resulting in good cutting performance and smaller cutting-tool wear. A biaxial ultrasonically assisted machining system is designed, fabricated and mounted on a machine-tool worktable. At the meantime, a long-term oscillation test including calibration and detailed adjustment is conducted repeatedly until the normal manipulation of the whole system is assured. Under these assistances, milling experiments of quartz glass by cutting-tool of extra-fine particle tungsten carbide with nACo® coating were conducted. And the full factorial experiments of process parameter combinations such as feed rate, cutting velocity and radial depth of cut were also planned. During the experiments, dynamometer is used to monitor the variation of cutting force. Tool wear, edge-indentation and side surface morphology of the quartz glass will be measured by tool-microscope off-line. Surface roughness measurement through a probe contact type instrument is also performed. The results show that the milling experiment with a biaxial ultrasonically assisted machining system with simultaneous dual-axis oscillations has the better results than those experiments without assistance and with uniaxial ultrasonically assisted. Because the use of this biaxial ultrasonically assisted system, the cutting performance of tool wear and surface roughness are improved significantly.

A quality photocatalytic activity of an amorphous titanium oxide film achieved using the selectively photochemical etching and its application for the organic light emitting diode encapsulation

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Keywords: selectively photochemical etching, amorphous titanium oxide, photocatalytic activity, organic light emitting diode, self-cleaning, light extraction efficiency

Abstract. In this study, a rapid, cost-effective, and room-temperature achieved selectively photochemical etching (SPCE) method was developed to improve the photocatalytic activity of a PECVD-deposited amorphous titanium oxide (a-TiO_x) film. The a-TiO_x film treated by the SPCE method for only 60 sec. showed the photocatalytic activity comparable to that of a high-temperature prepared TiO_x film with anatase structures. The mechanism responsible for the significant enhancement on the photocatalytic activity was ascribed to the formation of the nano-textures with the incorporating of fluorine ions on the surface as examined using AFM, FE-SEM, and XPS measurements. The SPCE-treated a-TiO_x film was then applied to encapsulate the blue organic light emitting diode (OLED) to result in the surface with self-cleaning function. A super-hydrophilic surface (i.e. the water contact angle below 5^o) was available after irradiating the device's light (~0.3 mW/cm^2 at 488 nm) for 5 hrs. In addition, the OLED encapsulated by the SPCE-treated a-TiO_x film also was beneficial for the enhancing the light-extraction efficiency by a factor of 1.25 as a consequence of its notably nano-textured surface.