

出國報告（出國類別：參加國際研討會）

參加「國際學術研討會 2017 IEEE International Conference on Applied System Innovation (IEEE ICASI 2017)」

服務機關：國立虎尾科技大學機械設計系

姓名職稱：林瑞璋 教授

派赴國家：日本，札幌市， Japan

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摘要

此次研討會 2017 IEEE International Conference on Applied System Innovation (IEEE ICASI 2017) 主要由 IEEE Tainan Section Sensors Council (IEEE TSSC), Taiwanese Institute of Knowledge Innovation (TIKI) 承辦並負責相關程序與業務, 研討會主題包含之領域及主題包括: information technology, innovation design, communication science & engineering, industrial design, creative design, applied mathematics, computer science, design theory, cultural & creative research, electrical & electronic engineering, mechanical & automation engineering, green technology & architecture engineering, material science and other related fields. Professionals from industry, academia and government are encouraged to discourse on research and development, professional practice, business and management in the information, innovation, communication and engineering fields 為一綜合型及整合性之國際研討會暨跨領域之交流互動平台。會地點位於日本, 札幌市 (Sapporo, Japan) 的 Hotel Emisia Sapporo 主要與會者包含日本、韓國、臺灣與亞太地區相關領域之專家學者, 此次主題除各工程領域之論文發表暨研討外, 亦由 Mo Li, Ph. D (Professor, School of Materials Science and Engineering, Georgia Institute of Technology, United States) 發表一場關於生科分析之深入專題演講 (Keynote Speech), 演講題目為: Relevant length scales, size effect, and nanomechanics of metallic glasses。

研討會中所提報之論文題目為 Study on the Strength of Composite Material for CNC Grinder Base Structure, 針對此一主題, 除就論文進行與會人士進行相關討論。此一主題主要主要研發新的研磨機, 並研發新材質之機台底座, 增加研磨機之剛性, 以減少震動, 進而發展自動化之補償及偵測機台誤差模組, 以提升精密機械設備在切削力之作用下精度改善策略與效率, 藉此亦有助於關鍵技術之自主化及提供邁向快速銜接工業 4.0 之可行性。另外, 亦就與其中與會學者之討論及相關建議, 可望對本研究未來架構之改善具正面幫助。

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壹、目的

一、計畫目標

林瑞璋教授參加在日本，札幌市 (Sapporo, Japan) 舉辦 **2017 IEEE International Conference on Applied System Innovation May 13-17, 2017, Hotel emisia, Sapporo, Japan**，國際研討會，主題包括：information technology, innovation design, communication science & engineering, industrial design, creative design, applied mathematics, computer science, design theory, cultural & creative research, electrical & electronic engineering, mechanical & automation engineering, green technology & architecture engineering, material science and other related fields. Professionals from industry, academia and government are encouraged to discourse on research and development, professional practice, business and management in the information, innovation, communication and engineering。並針對新世代的科學趨勢方向進行國際學術交流與討論，並籌畫未來之學術研究方向，規劃與導入學校及培育研究生朝創新技術為導向，進而培訓國內優秀研究與技術人才及提供產、學訓之技術。

二、主題

2017 IEEE International Conference on Applied System Innovation (IEEE ICASI 2017)，國際研討會提供一個會議平台，包含(A) Material Science & Engineering; (B) Communication Science & Engineering; (C) Computer Science & Information Technology; (D) Computational Science & Engineering; (E) Electrical & Electronic Engineering; (F) Mechanical & Automation Engineering; (G) Green Technology & Architecture Engineering ; (H) Innovation Design & Creative Design; (I) Industrial Design & Design Theory; (J) Cultural & Creative Research; (K) Applied Mathematics; (L) Management Science; (M) STEM education & Teaching aid ; (N) Others.，等相關領域。會議期間匯集來自各地的科學與工程人才藉由發表、討論對自己有興趣

之論文進行交流與討論。

三、緣起

本研究團隊以研究工具機各項技術創新實用科學技術為基礎，並以發展創改善工具機精度技術與學術研究為目標。積極參與國際研討會與發表國際期刊，今年將其中論文發表於 2017 IEEE International Conference on Applied System Innovation (IEEE ICASI 2017)，標題為: Study on the Strength of Composite Material for CNC Grinder Base Structure

為研究相關的研究成果。

四、預期效益與預達成事項

研討會除發表論文之外，積極聽取相關領域技術報告，研討會接受之論文，除刊登於研討會 論文集之外，可獲推薦國際期刊之機會及 best paper。



貳、 過程

其整個行程如下：

Saturday, May 13, 2017

2:00pm 6:00pm Sponsor Showcase (Grand Ballroom)

4:00pm

8:00pm Early Conference Registration and Conference Information Collection
(Reception Hall)

Sunday, May 14, 2017

8:00am 9:00am Conference Registration and Conference Information Collection
(International Conference Room, Building A)

9:00am 9:20am Opening Ceremony (International Conference Room, Building A)

09:20am 10:00am Keynote Speech 1 (International Conference Room, Building A)

10:00am 10:20am Coffee Break

10:20am 11:10am Keynote Speech 2 (International Conference Room, Building A)

11:10am 12:00am Keynote Speech 3 (International Conference Room, Building A)

12:10pm 1:30pm Lunch (Ballroom)

1:30pm 5:30pm Poster session (Ballroom)

1:30pm 5:30pm Breakout Sessions of ICASI 2017, Oral
(International Conference Room, Building A1, A2, A3 and A4)

6:00pm 8:30pm Conference Dinner (Ballroom)

Monday, May15, 2017

8:00am 9:00am Conference Registration and Conference Information Collection
(International Conference Room, Building A)

9:00am 12:00am

Breakout Sessions of ICASI 2017, Oral
(International Conference Room, Building A1, A2, A3 and A4)

9:00am 11:50am Poster session (Ballroom)

10:40am 11:00am Coffee Break

1:00pm 05:30pm Breakout Sessions of ICASI 2017, Oral
(International Conference Room, Building A1, A2, A3 and A4)

1:30pm 4:30pm Poster session (Ballroom)

Tuesday, May 16, 2017

8:00am 9:00am Conference Registration and Conference Information Collection
(International Conference Room, Building A)

9:00am 12:00am Breakout Sessions of ICASI 2017, Oral
(International Conference Room, Building A1, A2, A3 and A4)

9:00am 11:50am Poster session (Ballroom)

10:40am 11:00am Coffee Break

1:30am 5:30am Breakout Sessions of ICASI 2017, Oral
(International Conference Room, Building A1, A2, A3 and A4)

1:30pm 2:50pm Poster session (Ballroom)

Wednesday, May 17, 2017

8:00am 9:00am Conference Registration and Conference Information Collection
(International Conference Room, Building A)

9:00am 9:20am Closing Ceremony

9:20am 12:00am Sponsor Showcase (Ballroom)

如下圖為開幕典禮相片：



參、心得及建議

在參與 2017 IEEE International Conference on Applied System Innovation (IEEE ICASI 2017) 的會議中，除主辦單位之用心外，結合各國之學者提供研究心得，交換技術能量。尤其各地的研究單位提出優秀的研究成果，值得各國之學研單位效仿與學習。藉由國際學者間的學術交流可刺激研究導向的發展，並藉由學術交流並建立國際學術之友誼關係。目前日本不論在精密機械之自動化或智慧化皆具世界級之高技術水準，在東亞地區亦具主導及領先之地位與影響力，因此，宜鼓勵及補助老師或學生多參與此類日本之相關學術研討會，以增進雙邊互動及交流及提升暨累積國內此領域之技術能力。

此次除研究學者參與之外，也有不少之世界各地大學的研究生具有優秀的專業能力與宏觀的國際觀。此方面我國的研究生或研究專才對於各領域之專業技能與學術發展應繼續努力與全世界同步，強化專業學識與技能開發。我國之研究團隊應積極培育研究生，亦可結合各領域的研究團隊發展跨領域的科學研究與開創新穎的學術價值。建議學校應該可以多多培訓與鼓勵期參與國外之研討會，吸收更多之資訊。

除了建議：建立了初步良好的國際研究合作模式，科學與技術項目以外，亦包括了研究生、教授與研究人員的雙方人員互訪與交流。並期待未來可邀請國外優秀學者到國內演講與做跨國學術研究，以及導入國際水準之新興科技與專業技術。故本次重點於：

(1) 研討會每天有多個分項議程(Sessions)同時研討，主題多元涵蓋各領域，包括：
(A) Material Science & Engineering; (B) Communication Science & Engineering; (C) Computer Science & Information Technology; (D) Computational Science & Engineering; (E) Electrical & Electronic Engineering; (F) Mechanical & Automation Engineering; (G) Green Technology & Architecture Engineering ; (H) Innovation Design & Creative Design; (I) Industrial Design & Design Theory; (J) Cultural & Creative Research; (K) Applied Mathematics; (L) Management Science; (M) STEM education & Teaching aid ; (N) Others. ,
等，此研討會之主題與筆者之教學與研究領域密切相關，因此獲益不少。

(2) 國內學者應該踴躍參加國際會議，提高台灣的學術地位，進而建立與國外學

界良好的學術互動管道，以增進學界的關係，創造更多研究的議題。除此之外，國內應更加積極獎勵及補助國內學者參加國際會議，以提升研究品質與擴大視野。

(3) 會中每一篇文章的研討時間約 20 分鐘，研討的方式是由文章的作者發表著作並進行問答，發表及問答通常會交錯進行，參加的人員可以自由向作者提問，或逕行互相討論。因為與會的主席和參與者都有充分的準備，會中的討論都非常踴躍，頗值得國內學術會議效法。

(4) 此次會議除了各國之主要學者雲集外，亦有醫生與多國博士班研究生亦參與此國際研討會，國內應更加積極獎勵及補助國內研究生參加國際會議。

最後，本次出國參加國際研討會能夠獲得本校補助，在此特別致謝。

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Study on the Strength of Composite Material for CNC Grinder Base Structure

Jui-Chang Lin^{1,a} and Cheng-Jen Lin^{1,b}

¹National Formosa University

^anhit100@gmail.com, ^bicj@nfu.edu.tw

Corresponding author: Jui-Chang Lin, nhit100@gmail.com

Keywords: CNC Grinder Machine, Optimized Design, Equivalent Stress, Vibration Frequency Analysis

Abstract:

In this study, it is possible to find a suitable composite material for the strength of the composite foundation of CNC grinding machine to replace the use of metal base. To reduce the weight of CNC grinding machine and can increase its seismic capacity. The main points of this study are: 1. Structural stiffness analysis, stress and deformation of the structure caused by the external load distribution of the CNC machine. 2. Vibration frequency analysis, analysis of the natural frequency of grinding machine will be avoided resonance.

The study result appears as following, max value of equivalent stress and average amount of displacement in structural rigidity analysis are 0.67(Mpa) and 0.92(μ m). And modal analysis compared with the experimental, the average error percentage was less than 10% of parts. The whole structure percentage error does not exceed 3%, shows the results of analysis and practical percussion data conformance with nice, and has its reference value in the structural design phase.