出國報告（出國類別：國際會議）

出席 2016 ICET 國際學術研討會報告

服務機關：國立高雄應用科技大學
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摘要

2016 年 ICET [工程經濟與貿易國際研討會] (2016 International Conference on Economics and Trade)，今年 5 月 14 日至 5 月 16 日於蘇州園外樓會議堂舉行，本次會議乃年度會議，結合 ICET, SSTE 兩大研討會於一爐; 主題涵蓋:教育(Education), 資工(Computer and Information Sciences), 工程(Engineering) (包括土木 Civil, 機械 Mechanical, 生醫 Biomedical 等), 企業發展(Business Innovation), 經濟財務與管理(Economics, Finance and Management), 社會科學(Social Science), 財務(Finance), 網路安全(Internet Security) 等。本人受邀出席此次會議擔任 keynote Speaker 發表一篇英文專題演講，講題為: “On the Application of Artificial Intelligence Technologies to Risk Assessment and Control in Engineering and Social Sciences”[關於人工智慧技術在工程與社會科學風險評控之應用]，並附帶順路參觀蘇州與上海大陸土木都市發展與規畫，學習成果堪稱滿意。

關鍵詞: ICET，國際學術研討會，學術交流，研究發展，專題演講

目次

1 目的:

本次參加 2016 年 ICET [工程經濟與貿易國際研討會] (2016 International Conference on Economics and Trade) 之原定計畫目標與主要目的為應邀發表一篇英文專題演講，講題為: “On the Application of Artificial Intelligence Technologies to Risk Assessment and Control in Engineering and Social Sciences”[關於人工智慧技術在工程與社會科學風險評控之應用]。本人為國立高雄應用科技大學土木工程系副教授。

除發表一篇英文專題演講外，並聆聽大會主講者之精譬演講，及與會發表之其他精彩論文，藉以提升研發知能，觀摩發表技巧等。附帶利用開會之閒暇時光對蘇州(文化古城)與上海(現代化都市)在土木都市及交通建設進行初步考察，期能對未來教學研究有所提升助益。

2. 過程:

2.1 行程概要:

(1) 第一天: (高雄-蘇州) : 去程

2016/05/14(六) 07:20 ~ 09:30 去程(華航 CI-0581) 高雄小港機場~上海浦東機場

10:00 ~ 14:00 長途巴士: 浦東機場—蘇州火車站

14:00 ~ 15:00 地鐵: 蘇州火車站 – 園外樓

15:00 ~ 17:30 報到及會議會場認識

(2) 第二天: (蘇州): 發表專題演講

2016/05/15(日) 09:00 - 09:10 開幕式

09:10 - 09:40 Keynote Speech by Prof.Lu Liu

09:40 - 10:00 Tea Break

10:00 - 10:30 **Keynote Speech by Prof.Huang,Li-Jeng**

10:30 - 12:00 Oral Presentation

12:00 - 14:00 Lunch Time(1F 環秀廳)

14:00 - 17:00 Oral Presentation & Postal Presentaton

(3) 第三天: (蘇州-上海):

2016/05/16(一) 08:00 - 12:00 留園, 拙政園, 寒山寺參觀

13:00 – 17:00 高速鐵路及地鐵: 蘇州—上海

(4) 第四天: (上海-高雄): 回程

2016/05/17(二) 09:00 - 10:45 巴士: 飯店--上海浦東機場

10:45 - 12:55 回程(華航 CI-10582) 上海浦東機場~高雄小港機場

2.2 會議議程

2016/05/14(六) 9:00-16:30 大會準備

2016/05/15(日) 9:00-9:10 Open Ceremony(1F 飛虹廳)

9:10-9:40 Keynote Speech by Prof.Lu Liu

9:40-10:00 Tea Break

10:00-10:30 **Keynote Speech by Prof.Huang,Li-Jeng**

10:30-12:00 Oral Presentation

12:00-14:00 Lunch Time(1F 環秀廳)

14:00-17:00 Oral Presentation & Postal Presentaton

2.3 議場主題: 2016 工程經濟與貿易風險評估與控管相關主題研討

2.4 個人所發表[專題演講](Keynote Speech)內容摘要

(中譯)

本演講主要講述人工關於人工智慧技術在工程與社會科學風險評控之應用，摘述人工智慧於近年來在工程科學至社會科學許多領域，如天災、管理、經濟、公共事務、國際關係等。特別提出由不確定因素分析, 至風險指標計算等一套系統化計量的風險評估方法。此外並特別講述各種常用人工智慧技術的優缺點，包括: 模糊推論、灰色系統、遺傳演算、人工神經網路、專家系統等。接著並分別以自然災害(土石流)及經濟變動(股市)為例，說明以 Android 及 MATLAB 開發人工智慧風險評估與管控程式之案例。最後並提出未來研究之可能性。

(原文):

Current state of the arts and research trends on the application of artificial intelligence (AI) technologies to quantitative risk assessment in many fields, especially from engineering science to social science such as management, economics, public affairs and international relations, are summarized and presented. A systematic quantitative approach for risk assessment starting from the uncertain influence factor analysis, risk impact analysis, to overall risk index calculation is mainly reviewed. Furthermore, features and approaches of many AI technologies including fuzzy inference, grey system theories, revolutionary algorithm, artificial neural networks, expert systems, etc., which are highly potentially applicable to research on the risk assessment, prediction and control of engineering and social science hazards will be discussed.

2.5 討論交流情形

論文發表與討論熱烈: 與會者來自不同國家，包括中華民國台灣(主要包括國立高雄應用科大，國立金門大學，海峽對岸的北京交通大學，四川成都大學，廣州南中教育大學，西安科技大學等). 發表時都全程使用英語，我對某些瞭解與感興趣之主題，也非常熱切參與提問，對於每篇發表者也適度予以提問(以下保留英文答問原貌):

(1) ICET-2542: Yu-Ping LIU, Xiao-Yuan SUN, Shou-Wen JI,
"Research on Trust Mechanism of Dairy-product Chain Members Based-on Game Theory."

Q1: Are there existing alternate theories for your study?
A1: Surely, however, game theory seems to be the most appropriate.
Q2: In the analysis of influence factors there might exist uncertainties, suppose that fuzzy or grey system theory can be applied in this fold.
A2: yes, I agree with you.

(2) ICET-2543: Lu-Yang ZHANG, Zhao-Zhao YU, Shou-Wen JI,
"Research on Multi-link Task Assignment in Dynamic Logistics Alliances Based on Improved GeneticAlgorithm."

Q1: In your GA model how many epochs needed for convergence to a certain value?
A1: Well, it depends, in our study it requires about thousands of epochs.

(3) ICET-2524: Lei TENG, Shi-Yu WANG,
"Asset Securitization of Internet Finance"

Q1: Did you consider applying AI techniques in the risk analysis of internet finance security?
A1: Yes, I will try to do it. Nowadays, we had attempted to conduct the information analysis and risk management.

(4) ICET-2550: Hong-Ming HOU, Hong-Shen PANG, Yi-Bing SONG, Hai-Yun XU, Jin-Hui-Ni XIONG, Xiao-Yan JIANG, Wei ZHANG
"The Investigation of Bio-medical Science and Technology Innovation Service Platform in Guangzhou."

Q1: What are basic preparation of these platform?
A1: Data bases, proper procedures, and professional information engineers.

(5) ICET-2551: Chang-Zheng ZHANG, Yue-Fan LV,
"A Multi-stage Evolution Model of Perceived Fairness on Executive-empoyee Pay Gap."

Q1: Among the 4 inter-correlated stages which one is the most dynamic and uncertain?
A1: We suppose is the third stage,i.e., the out-break stage.

發表時間頗為充裕:含 Q & A 每篇約有 15 分鐘, 進行十分順利。

3．心得及建議:

3.1 心得:

此次會議乃綜合性會議，結合 ICET, SSTE 兩項研討會於一爐; 主題涵蓋:教育(Education), 資工(Computer and Information Sciences), 工程(Engineering)(包括土木 Civil, 機械 Mechanical, 生醫 Biomedical 等), 企業發展(Business Innovation), 經濟財務與管理(Economics, Finance and Management), 社會科學(Social Science), 財務(Finance), 網路安全(Internet Security) 等,。本人應邀出席此次會議全程以英文發表一篇專題演講(keynote Speech)，並參與其他發表者之討論，發表經驗與學習成果堪稱滿意。主要心得條列如下:

(1) 個人發表之 Keynote Speech 稱得上是緊湊精彩，我採用實例演示再加解說的方式講述。讓我意外的是，來聆聽的有國立金門大學的呂孟駿教授 (他也是大會的 Committee 之一) 及湖南、江蘇、四川、蒙古大學之教授與研究生外，還有來自內蒙古呼和浩特市專程來聆聽演講(沒有發表論文)之碩士研究生，讓我對大陸的研究生在求知之熱切感到驚異。

(2) 此次我以本校名義發表一篇英文專題演講, 也算相當難得。本人因親自上台以英語發表，更得到深刻之體驗。全程以英語進行專業之主題演講(Keynote Speech), 對本校聲望之提升也有助益，對我更是一次難得的體驗與學習機會。

(3) 大陸學者之研究論題寬廣，發表態度積極值得學習。

(4) 本人利用其他空檔有對蘇州(文化古城)與上海(現代化都市)在土木都市及交通建設進行初步考察，期能對未來教學研究有所提升助益。以下摘記優缺點:

(a) Shanghai 不僅都市高度繁榮， 其交通建設相當完備 (飛機, 高鐵, 捷運， 長短程巴士, 計程車等) ， Disney 也計畫在該地開發，看得出這是一個不斷在成長之都市。

(b) Shanghai 浦東機場動線清楚， 可以快速引導分散機場排隊人潮， 減少旅客負擔，非常值得借鏡。。

(c) Suzhou 計程車司機普遍駕駛速度相當快，感覺風險頗高， 這點台灣的司機表現較佳，不過價格倒是很親民

(d) Suzhou 風景區保留古蹟很用心，文化觀光資源豐富。

(e) Suzhou 至 Shanghai 高鐵非常快速，但人多擁擠，多少影響乘坐品質。

3.2 建議

(1) 多鼓勵學者出席參加國際性會議, 可開拓視野, 提升國際觀。

(2) 國內主動舉辦國際會議除促進交流外，亦有助於觀光及經濟發展。

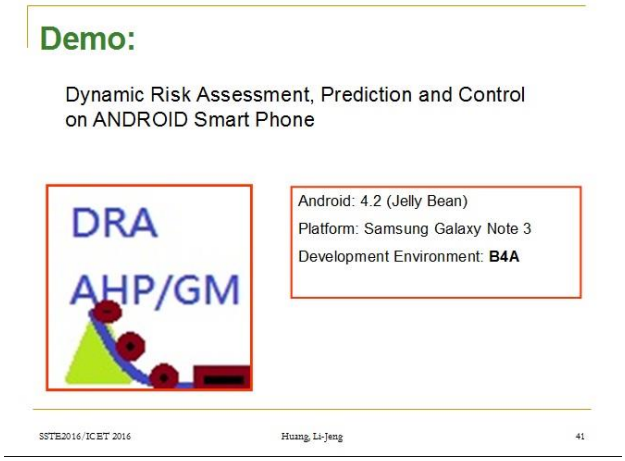
附錄:

A1: 有關出席研討會之照片

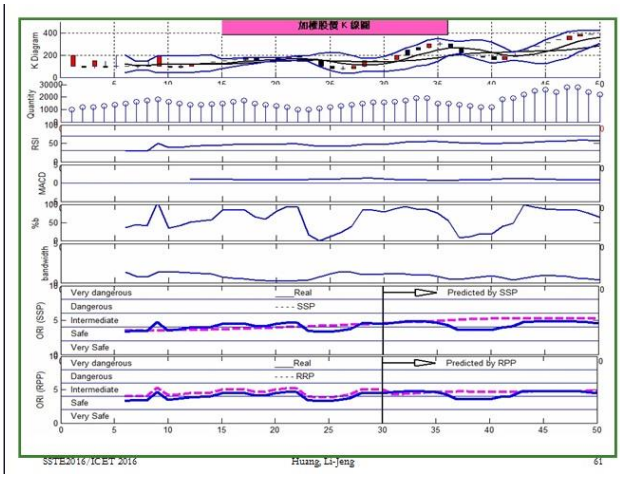
(1) 演獎照片 1

(2) 演獎照片 2

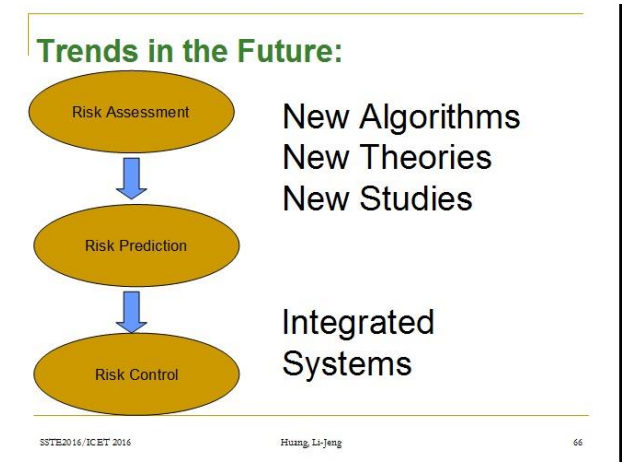
(3) 演講大綱



(4) Demo-1: 在自然工程災害風險評估之應用



(5) Demo-2: 在經濟變動風險評估之應用



(6) 未來研究之建議

A2：發表專題演講摘要：

On the Application of Artificial Intelligence Technologies to Risk Assessment and Control in Engineering and Social Sciences

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Abstract. Current state of the arts and research trends on the application of artificial intelligence (AI) technologies to quantitative risk assessment in many fields, especially from engineering science to social science such as management, economics, public affairs and international relations, are summarized and presented. A systematic quantitative approach for risk assessment starting from the uncertain influence factor analysis, risk impact analysis, to overall risk index calculation is mainly reviewed. Furthermore, features and approaches of many AI technologies including fuzzy inference, grey system theories, revolutionary algorithm, artificial neural networks, expert systems, etc., which are highly potentially applicable to research on the risk assessment, prediction and control of engineering and social science hazards will be discussed.

Keywords: Artificial Intelligence, Quantitative Approach, Risk Assessment.

Introduction

Artificial Intelligence (AI) can be defined to be *computer science and technology that makes the computer system or agent work to solve many problems based on learning, thinking, inference of human beings to select optimal policies or solutions*.

What are the key topics of AI technologies:

- Fuzzy Logic (FL), Grey System (GS), Rough Sets (RS)
- Expert Systems (ES)
- Knowledge Engineering (KE)
- Data Mining (DM)
- Genetic Algorithm (GA), Anealing Simulation (AS)
- Artificial Neural Networks (ANN)