目　　錄

序言

第 27 屆工業、工程與智慧系統應用國際研討會之特別議程-科技部專題研究計畫成果發表會將於 2014 年 6 月 6 日在台灣高雄國賓大飯店舉行並廣邀國內學者專家參與交流，此次成果發表會由國立高雄應用科技大學、國科會工程科技發展中心、台灣網路智能學會、中華民國民生電子學會與朝陽科技大學共同舉辦。用意在於提供執行科技部專題研究計畫的學者專家發表成果外，也提供產學交流的機會與平台。此特別議程所徵求領域包括下列領域：資訊工程、通訊工程、控制工程、電力工程、電腦科學、自動化工程、微電子工程、生物醫學工程與光學與光電工程的計畫成果。

在 IEA-AIE2014 特別議程-科技部專題研究計畫成果發表會中，結合工業、工程與智慧系統應用與科技部計畫研究成果發表的活動，預計至少 100 位人員以及多家廠商的參與。相信將會是一次值得期待的活動，也希望未來能有更多精彩的成果發表，能讓更多學者們互相交流以增進學術研究。

另外，大會特別邀請電子科技大學朱策教授以「3D-TV System with Depth-Image-Based Rendering: Towards High Quality 3D Video」，與高雄大學洪宗貝教授以「Applying Computational Intelligence Techniques to Knowledge Engineering」為題進行專題演講，相信兩位教授的演講能夠讓各位與會人員有所啟發。特別感謝國科會工程科技推廣中心大力支持，於推廣國科會各領域交流不遺餘力。

最後，誠摯的歡迎各位遠到而來的計畫、主持人與辛勤準備的工作人員，使此次活動圓滿。

IEA-AIE2014 國際研討會暨科技部特別議程大會主席

潘正祥

敬上

2014 年 6 月 6 日

IEA-AIE2014 國際研討會特別議程展徵稿通知

第 27 屆工業、工程與智慧系統應用國際研討會
特別議程:科技部專題研究計畫成果發表會
高雄國賓大飯店
中華民國 103 年 6 月 6 日

榮譽主席：楊正宏(高應大)
鍾任琴(朝陽科大)

大會主席：潘正祥(高應大)

議程主席：洪盟峰(高應大)

議程委員:
吳兆祥、吳明勳、李克怡、李金鳳、李惠明、李冠榮、沈榮麟、林世俊、林建州、邱登裕、施安仁、洪盟峰、胡武誌、胡淑華、侯文娟、張保榮、張基源、張傳育、章學賢、陳怡婷、陳昭和、陳培殷、陳聰毅、陳璽煌、陳朝烈、曾新穆、程毓明、黃永發、黃勃程、黃祥哲、廖斌毅、潘天賜、潘正祥、蔡正發、蔡俊明、鄭群星、謝仕杰、謝政勳、謝欽旭、羅有隆、譚旦旭、蘇怡仁、蘇維宗(依姓氏筆畫排列)

- 資訊工程
- 通訊工程
- 控制工程
- 電力工程
- 自動化工程
- 微電子工程
- 生物醫學工程
- 光學與光電工程

第 27 屆國際工業、工程與智慧系統應用研討會(IEA-AIE)2014，特別議程：科技部專題研究計畫成果發表會，將於 2014 年 6 月 6 日在高雄國賓大飯店舉行。其中科技部研究成果特別議程旨在提供一成果發表及產學合作交流平台，讓參與科技部專題研究計畫研究人員藉以交流與討論其研究成果。因此徵求研究成果報告將不限於下列領域：

投稿文件需依科技部精簡報告格式，請於 103 年 4 月 1 日(二)之前 mail 至 mst-etpc14@bit.kuas.edu.tw，大會將於在 103 年 5 月 20 日(二)通知錄取稿件，每篇錄取之文章至少要有一人在發表會上做報告。本發表會提供午、晚餐及特別議程手冊，並酌收新台幣 800 元報名費。

主辦單位:台灣網路智能學會、國立高雄應用科技大學電子工程系

協辦單位:科技部工程司工程科技推展中心、中華民國民生電子學會、朝陽科技大學

聯絡人：陳怡婷專任助理　07-38114526 轉 5651, E-mail:ytchen@bit.kuas.edu.tw
洪盟峰教授　07-38114526 轉 5632, E-mail:mfhorng@cc.kuas.edu.tw

主協辦單位

台灣網路智能學會

國立高雄應用科技大學

國家科學委員會工程技術推廣中心

中華民國民生電子學會

朝陽科技大學

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朝陽科技大學　鐘任琴

大會主席：

國立高雄應用科技大學　潘正祥教授

議程主席：

國立高雄應用科技大學　洪盟峰教授

顧問委員主席：

國立高雄應用科技大學　廖斌毅教授

公關主席：

國立高雄應用科技大學　洪冠明教授

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國立高雄應用科技大學　謝欽旭教授

財務主席：

國立高雄應用科技大學　張瑞芳副教授

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黃勃程	資策會	資策會創研所

黃祥哲	高雄大學	電機工程系
廖斌毅	高應科技大學	電子工程系
潘天賜	高應科技大學	電子工程系
潘正祥	高應科技大學	電子工程系
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譚旦旭	台北科技大學	電機工程系
蘇怡仁	樹德科技大學	資訊工程系
蘇維宗	真理大學	資訊工程系

專題演講(I)

Professor Ce Zhu (朱策)

University of Electronic Science and Technology of China, China

Topic:
3D-TV System with Depth-Image-Based Rendering: Towards High Quality 3D Video

Abstract:
Three-dimensional Television (3D-TV) is a promising candidate for the next generation broadcasting applications. Among 3D video technologies and viable prototypes, stereoscopic 3D video has gained a strong momentum in consumer market, establishing itself as the first wave of 3D-TV. Conventional multi-view video is a natural representation for stereoscopic displays, while more sophisticated 2D-plus-depth format with depth-image-based rendering (DIBR) has been attracting increasing attention from both industry and academia, as the DIBR technique helps to further advance the interactivity in 3D video systems and to significantly enhance the 3D visual experience relative to conventional stereoscopic systems. This talk will present a technical overview of DIBR-oriented 3D-TV system comprising main functional components of 3D content generation, coding and transmission, and displaying for creating 3D visual sensation, with specific discussions of recent advances on 3D visual distortion detection and reduction.

Biography:
Ce Zhu (M'03–SM'04) received the B.S. degree from Sichuan University, Chengdu, China, and the M. Eng. and Ph.D. degrees from Southeast University, Nanjing, China, in 1989, 1992, and 1994, respectively, all in electronic and information engineering. He pursued postdoctoral research at Chinese University of Hong Kong in 1995, City University of Hong Kong, and University of Melbourne, Australia, from 1996 to 1998. Dr. Zhu is now a professor with the school of Electronic Engineering, University of Electronic Science and Technology of China, China. He was with Nanyang Technological University, Singapore, for 14 years, where he had been an Associate Professor since 2005. He has held visiting positions at Queen Mary, University of London (UK), and Nagoya University (Japan). His research interests include image/video coding, streaming and processing, 3D video, joint source-channel coding, multimedia systems and applications. He has authored or

co-authored over 100 papers, lead-edited 3 books and contributed 4 book chapters, and filed 7 patents (5 granted and 1 transferred). He received best paper and student paper awards at two international conferences. Dr. Zhu serves on the editorial boards of seven international journals, including as an Associate Editor of IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on Broadcasting, IEEE Signal Processing Letters, Editor of IEEE Communications Surveys and Tutorials, Area Editor of Signal Processing: Image Communication (Elsevier), Associate Editor of Multidimensional Systems and Signal Processing (Springer), and Editorial Board Member of Multimedia Tools and Applications (Springer). He has served on technical/program committees, organizing committees and as track/session chairs for over 50 international conferences. He received 2010 Special Service Award from IEEE Broadcast Technology Society, and is an IEEE BTS Distinguished Lecturer (2012-2014).

專題演講(II)

Professor Tzung-Pei Hong (洪宗貝)

National University of Kaohsiung, Taiwan

Topic:
Applying Computational Intelligence Techniques to Knowledge Engineering

Abstract:

Knowledge engineering is an important research field for intelligent systems. It includes any kind of data or knowledge preprocessing, learning, mining, and integration. In this speech, I will introduce how computational intelligence can help improve the performance and quality of knowledge engineering. Three parts will be covered. In the first part, I will introduce several GA-based fuzzy data-mining methods for automatically extracting membership functions for fuzzy association rules. All the genetic-fuzzy mining methods first use evolutional computation to find membership functions suitable for mining problems and then use the final best set of membership functions to mine fuzzy association rules. Through appropriately designed fitness functions, these approaches can avoid the formation of bad kinds of membership functions and can provide important mining results to users. In addition, feature selection is an important pre-processing step in mining and learning. A good set of features can not only improve the accuracy of classification, but also reduce the time to derive rules. Thus in the second part, I will state some GA-based clustering methods for attribute clustering and feature selection. The proposed approaches for attribute clustering can also easily handle the problem of missing values in classification. In the last part, I will describe suitable integration techniques for various kinds of mined knowledge based on evolutionary computation. Some integration algorithms respectively derived from the Michigan approach and the Pittsburgh approach will be explained. The Michigan approach encodes each rule as an individual; on the contrary, the Pittsburgh approach encodes a rule set as an individual. Both of them have their own advantages and disadvantages.

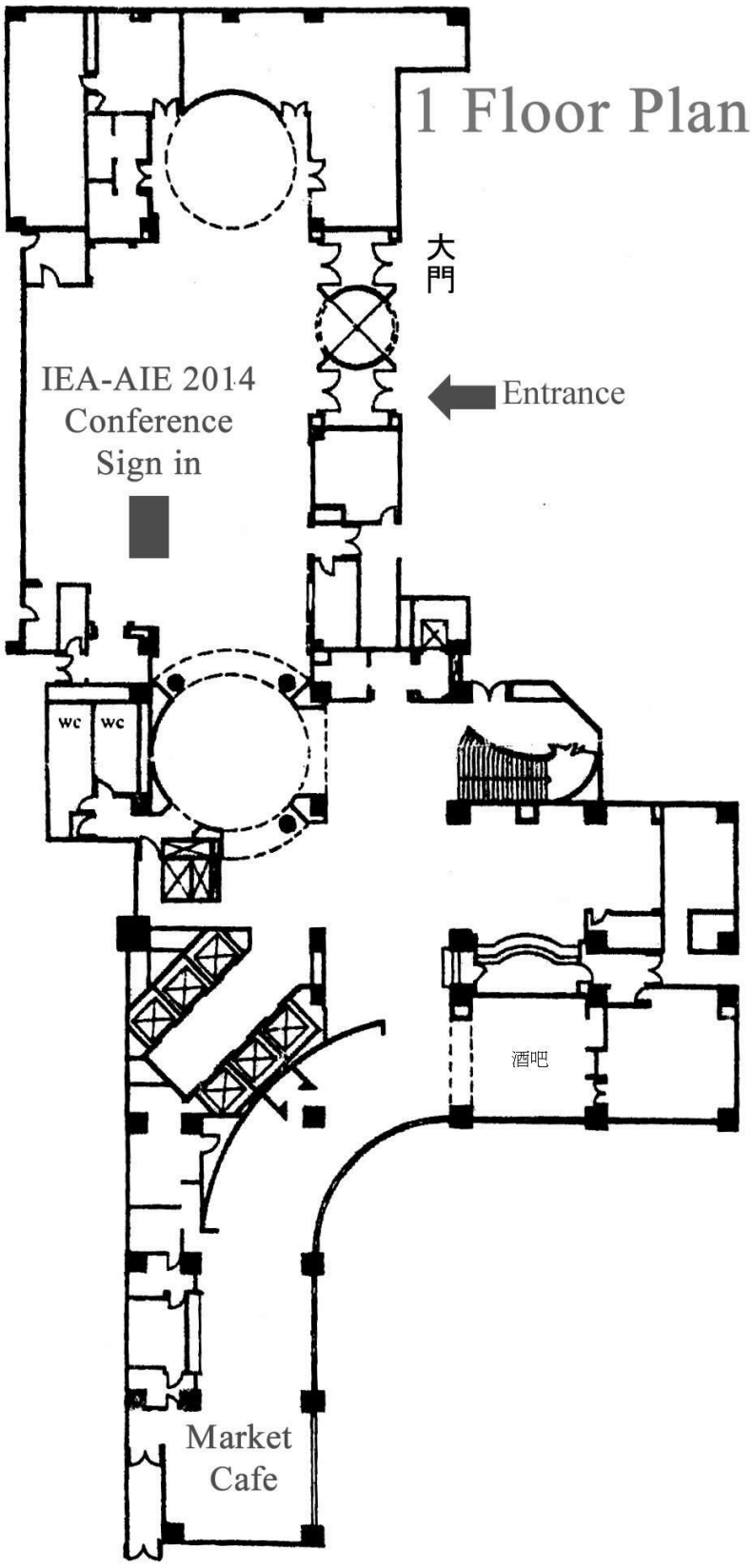
Biography:

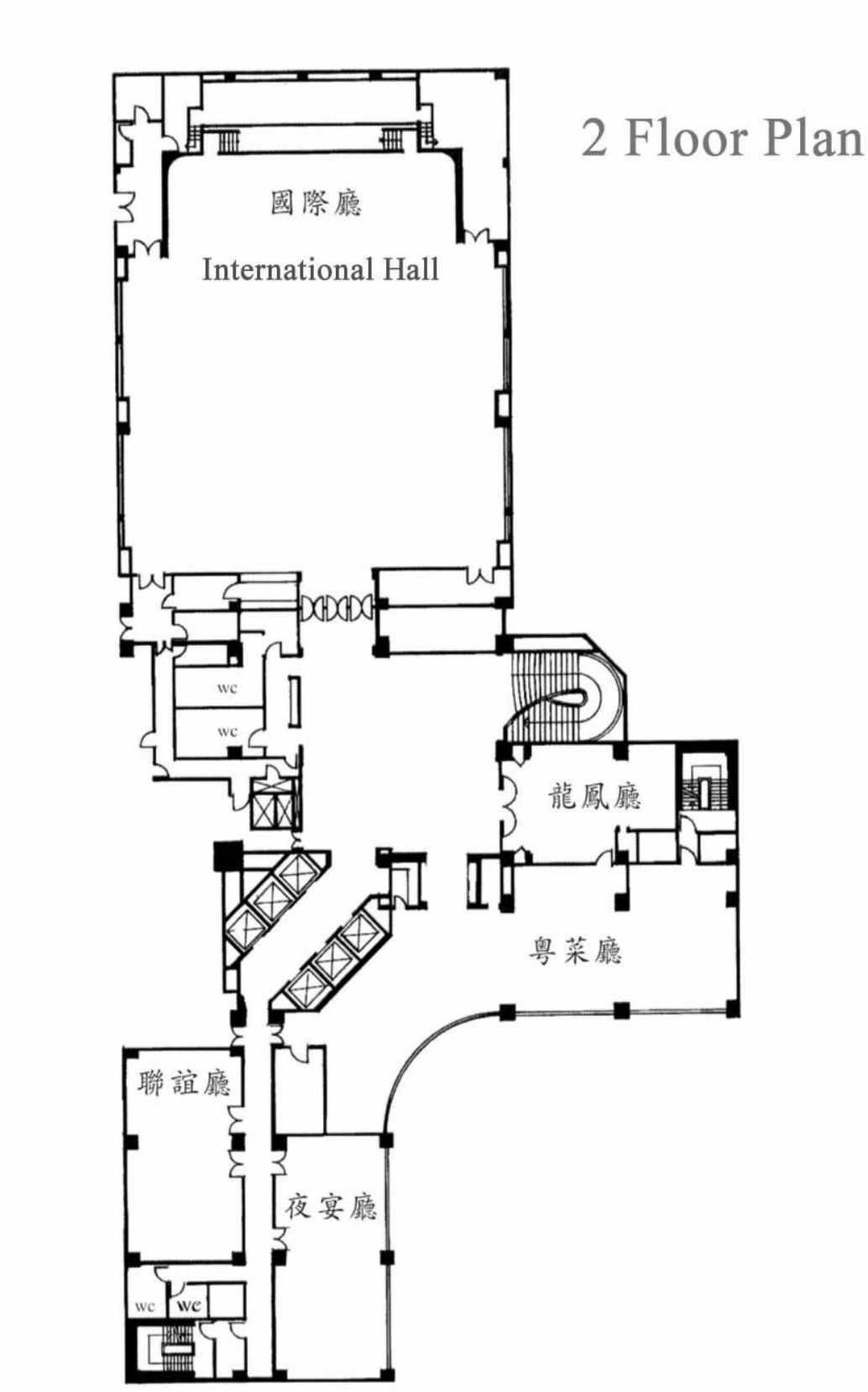
Tzung-Pei Hong received his B.S. degree in chemical engineering from National Taiwan University in 1985, and his Ph.D. degree in computer science and information engineering from National Chiao-Tung University in 1992. From 1987 to 1994, he was with the Laboratory of Knowledge Engineering, National Chiao-Tung University, where he was involved in applying techniques of parallel processing to artificial intelligence. He was an associate professor at the Department of Computer Science in Chung-Hua Polytechnic Institute from 1992 to 1994, and at the Department of Information Management in I-Shou University (originally Kaohsiung Polytechnic Institute) from 1994 to 1999. He was a professor in I-Shou University from 1999 to 2001. He was in charge of the whole computerization and library planning for National University of Kaohsiung in Preparation from 1997 to 2000 and served as the first director of the library and computer center in National University of Kaohsiung from 2000 to 2001, as the Dean of Academic Affairs from 2003 to 2006, as the Administrative Vice President from 2007 to 2008, and as the Academic Vice President from 2010 to 2011. He is currently a distinguished professor at the Department of Computer Science and Information Engineering and at the Department of Electrical Engineering. He has published more than 400 research papers in international/national journals and conferences and has planned more than fifty information systems. He is also the board member of more than forty journals and the program committee member of more than three hundred conferences. His current research interests include knowledge engineering, data mining, soft computing, management information systems, and www applications. Dr. Hong is a member of the Association for Computing Machinery, the IEEE, the Chinese Fuzzy Systems Association, the Taiwanese Association for Artificial Intelligence, and the Institute of Information and Computing Machinery.

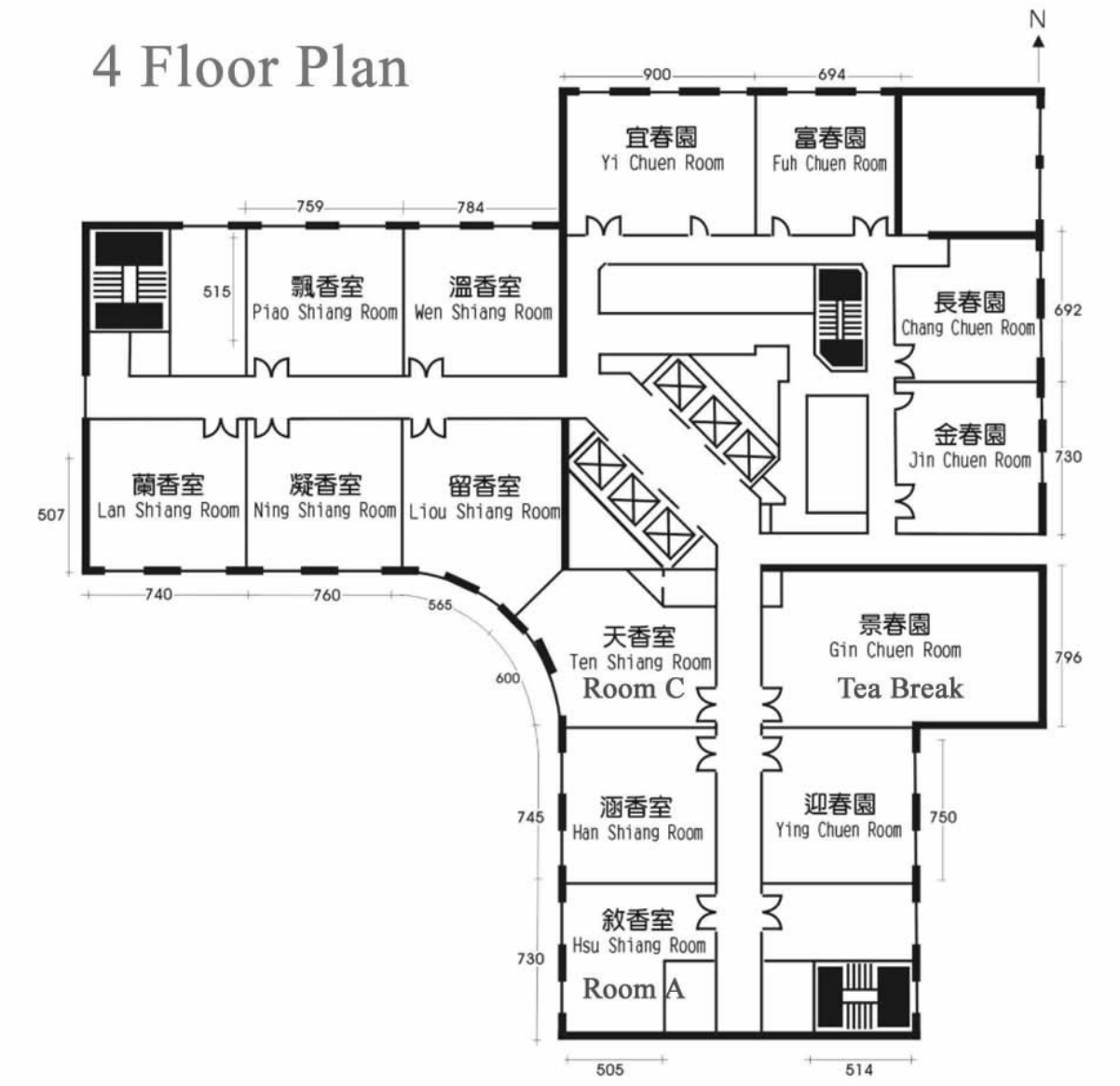
會場位置


愛河
七賢橋
七賢二路
往鳳鐵左營站
六合觀光夜市
捷運美麗島站
六合二路
捷運市議會站
自立二路
往高雄火車站
音樂館
工商展覽中心
歷史博物館
中正四路
大同二路
中山一路
國賓大飯店
AMBASSADOR
Kaohsiung
仁愛公園
河岸咖啡
電影圖書館
民生二路
中央公園
中華三路
捷運中央公園站
成功一路
自強二路
河西路
河東路
五福四路
五福橋
五福三路
真愛碼頭
往小琉球、旗津、愛之船
捷運紅線
捷運橘線

會議場地平面圖


1 Floor Plan
大門
IEA-AIE 2014
Conference
Sign in
Entrance
wc
wc
酒吧
Market
Cafe


2 Floor Plan
國際廳
International Hall
wc
wc
龍鳳廳
粵菜廳
聯誼廳
夜宴廳
wc
wc


4 Floor Plan
N
900
694
宜春園
Yi Chuen Room
富春園
Fuh Chuen Room
759
784
515
飄香室
Piao Shiang Room
溫香室
Wen Shiang Room
長春園
Chang Chuen Room
692
金春園
Jin Chuen Room
730
507
蘭香室
Lan Shiang Room
凝香室
Ning Shiang Room
留香室
Liou Shiang Room
740
760
565
600
天香室
Ten Shiang Room
Room C
景春園
Gin Chuen Room
Tea Break
796
745
涵香室
Han Shiang Room
迎春園
Ying Chuen Room
750
敘香室
Hsu Shiang Room
730
Room A
505
514


20 Floor Plan
WC
WC
川菜廳
Szechuan Court
陶然亭
Sky Lounge
Top of Ambassador
WC
WC

會議議程

June 6, 2014		
09:00 - 10:00	**專題演講 I** (20F 樓外樓)	
10:00 - 10:10	茶敘 (20F 樓外樓)	
10:10 - 11:00	**專題演講 II** (20F 樓外樓)	
11:10 - 11:20	茶敘 (4F 景春園)	
11:20 - 12:20	產學交流 (4F 景春園)	
12:20 - 13:30	午餐 (20F 樓外樓)	
13:30 - 15:30	產學交流 (4F 景春園)	
15:30 - 15:50	茶敘 (4F 景春園)	
15:50 - 17:50	科技部專題研究計畫成果發表 I (4F 敘香室)	科技部專題研究計畫成果發表 II (4F 天香室)
18:00	晚宴(2F 國際廳)	

計畫成果發表場次

IEA-AIE 2014 特別議程(I)：科技部專題研究計畫成果發表

時間：2014/6/6(五), 15:50 - 17:50

地點：4F 敘香室（Room A）

主持人：陳聰毅

E01-01

Deal with linguistic multi-criteria decision making problem based on sequential multi-person game methodology (NSC 101-2410-H-239-004-MY2, NSC101-2410-H-260-005-MY2)
Chen-Tung Chen, Ping Feng Pai, Wei Zhan Hung

E01-02

Using Artificial Neural Back-Propagation Network Model to Detect the Outliers in Semiconductor Manufacturing Machines (NSC 102-2410-H-141-012-MY2)
Keng-Chieh Yang, Chia-Hui Huang, Conna Yang, Pei-Yao Chao, Po-Hong Shih

E01-03

Answer Validation Concept Based Approach for Question Answering in Biomedical Domain (NSC 102-2221-E-003-027)
Wen-Juan Hou, Bing-Han Tsai

E01-04

支援安全駕駛之人車感測閘道技術研發 (NSC 101-2221-E-151-040-)
陳聰毅, 駱冠銘

E01-05

整合雲端聲控 OBD-II 與 Google Maps 之車載即時最佳路徑規劃與線上導航系統實作 (NSC 99-2220-E-366-004)
陳璽煌, 王駿發, 李聖捷, 陳俊宇, 林伯勳

E01-06

情緒語氣辨識 SOC 模組設計與實現(I) (NSC 100-2221-E-366-008)
陳璽煌, 王駿發, 王家慶, 林博川, 李聖捷, 林伯勳, 方品軒

E01-07

以整合式服務遷徙提升無線行動網路服務品質(III) (NSC 102-2221-e-151-004)
謝欽旭, 呂政達, 王皓廷

E01-08

應用於無線傳感器之重複事件資訊彙集與統合演算法(NSC 101-2221-E-151-060-)
潘正祥, 郭慕義, 楊幃傑

IEA-AIE 2014 特別議程(II)：科技部專題研究計畫成果發表

時間：2014/6/6(五), 15:50 - 17:50

地點：4F 天香室 (Room C)

主持人：程毓明

E02-01

Semantic Frame-based Natural Language Understanding for Intelligent Topic Detection Agent (NSC102-3111-Y-001-012, NSC102-3113-P-001-006, NSC 102-3114-Y-307-026)
Yung-Chun Chang, Yu-Lun Hsieh, Cen-Chieh Chen, Wen-Lian Hsu

E02-02

A Novel Method for Extracting Aging Load and Analyzing Load Characteristics in Residential Buildings (NSC 102-2221-E-228-002)
Hsueh-Hsien Chang, Meng-Chien Lee, Nanming Chen

E02-03

An Improved Liu's Ordering Theory Based on Empirical Distributive Critical Value (NSC 100-2511-S-468 -001)
Hsiang-Chuan Liu, Ben-Chang Shia, Der-Yin Cheng

E02-04

使用雲端 push service 建構一個訊息推播平台 (NSC 101-2631-S-366-001-CC2)
程毓明, 吳定穎, 陳柏甫

E02-05

應用變數分析探討頭頸癌在放射治療後發生口乾併發症機率之預測效力 (NSC-102-2221-E-182A-002)
李奎宏, 林世耀, 趙珮如, 洪盟峰, 方富民, 李財福

E02-06

腫瘤控制率與正常組織併發症之 Lyman 模型分析平台 (NSC 101-2221- E151 -007-MY3)
黃祥瑞, 陳仕偉, 黃郁傑, 李財福

E02-07

A GA-Based Approach to Efficient Resource Management of Virtual Machines in Clouds (NSC 101-2221-E-151-041-)
I-Hsun Chuang, Yu-Ting Tsai, Mong-Fong Horng, Yau-Hwang Kuo, Jang-Pong Hsu

E02-08

智慧型互動居家用電管理系統及其軟硬體平台之開發 (NSC102-2622-E-151-004-CC3)
廖斌毅, 洪冠明, 洪盟峰, 陳怡婷, 蔡明德, 范姜昱翔 , 陳友倫, 蔡秉峰 謝玫紜

IEA-AIE 2014
科技部專題研究計畫成果發表會

E01-01

Deal with linguistic multi-criteria decision making problem based on sequential multi-person game methodology

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Abstract

multiple criteria decision making (MCDM) problem handle the ranking order of alternatives with respect to various criteria in real environment. Uncertainties and vagueness should be considered because the qualitative criteria and the subjective judgment of decision-makers usually exist in the decision making process. It is reasonable for decision-makers to use linguistic variables to express their opinions. Game theory approach has been used as an efficient framework in copying with decision making problems. It can be applied extensively to solve the complex and interrelated practical decision problems. In fact, decision making approaches based on game theory have become an important research direction in decision science. The aim of this study is to develop an effective methodology for solving the game problem with linguistic variables by multiple decision makers. Based on the linguistic variable, the decision makers can easily express their opinions with respect to each criterion for each alternative. By using the backward induction method, we can find the rational solution of a game in accordance with the combination of strategies of players effectively. And then, a new decision making method, linguistic sequential multi-person multi-criteria game (LSMPMCG) model will be proposed for dealing with the fuzzy game problem in this study.

Keywords: Multi-criteria evaluation, Group decision making, Linguistic Variable, Sequential Game.

Acknowledgement

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E01-02

Using Artificial Neural Back-Propagation Network Model to Detect the Outliers in Semiconductor Manufacturing Machines

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Abstract

This study uses the artificial neural back-propagation network model to detect the outliers in semiconductor machines. The neural network model has the advantages of great precision and effectiveness. This research uses Novellus Vector Machine and its Remote Process Controller (RPC) function to collect the data. This study detects the gas transmission pressure of chamber. Our experimental results show that three-month period of network training data possesses the best results. We suggest that the prediction and model training be around 3 months.

Keywords: Semiconductor machine outliers, back-propagation network model, quality control in semiconductor manufacturing.

Acknowledgement

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E01-03

An Answer Validation Concept Based Approach for Question Answering in Biomedical Domain

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Abstract

With the continuously growing literatures in the biomedical domain, it is not feasible for researchers to manually go through all information for answering questions. The task of making knowledge contained in texts in forms that machines can use for automated processing is more and more important. This paper describes a system to answer multiple-choice questions for the biomedical domain while reading a given document. In this study, we use the data from the pilot task “machine reading of biomedical texts about Alzheimer’s disease” which is a task of the Question Answering for Machine Reading Evaluation (QA4MRE) Lab at CLEF 2012. We adapt the concept of answer validation that assumes the over-generation hypotheses will be checked in the validation step. In the following, the query expansion technique “global analysis” is applied. The best result is 0.51 c@1 score which is clearly above the baseline at CLEF 2012 and shows an exhilarating performance.

Keywords: Question answering system, Answer validation, Query expansion, Question answering for machine reading evaluation

Acknowledgement

Research of this paper was partially supported by National Science Council, Taiwan, under the contract NSC 102-2221-E-003-027.

E01-04

支援安全駕駛之人車感測閘道技術研發

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中文摘要

汽車的發明不僅帶動工業革命，也使經濟大幅成長，對人類是一大貢獻。汽車數量的增長雖然帶來多方面的益處，但隨之而來的諸多問題也不容輕忽，如交通事故、空氣汙染以及全球暖化等問題，皆是影響民眾生命財產以及生活品質的重要原因。如何有效改善交通事故以及環境污染等議題，進而提升民眾的用路安全以及居住的環境品質，將是一個刻不容緩的問題。本計畫提出一個高準確率的危險駕駛行為偵測方法。以三軸加速度感測器測量車輛不同行駛狀態的加速度變化，以 ZigBee 無線感測網路傳輸，最後利用平板電腦作為運算單元。由於高低速行駛時的加速度變化以及行駛狀態的維持時間皆有所不同，因此本研究利用 On Board Diagnostics Phase2 (OBD-II) 讀取車輛即時速度，在低速至高速間動態調整判斷所需的參數，以利正確辨識行駛狀態。經過實驗證明此方法的確有效增加準確率，一般道路以及高速公路的總行駛狀態辨識率分別達到 91.2%和 90.6%。另外，本計畫不僅使用時速、轉速等資訊，更是成功利用空氣流量、節氣門位置、時速、轉速等引擎資訊之間的關係，辨識出怠速未熄火的行為，並以簡訊警示駕駛以及管理者，希望達到降低怠速空汙的效果。並且系統可將所辨識到的駕駛行為儲存於雲端伺服器，透過應用程式提供雲端服務。例如連接 Google 或其他雲端服務供應商來記錄危險駕駛行為，提供保險公司及交通管理單位應用。

關鍵詞：ZigBee網路、三軸加速度感測器、OBD-II、駕駛行為辨識

Abstract

The traffic safety and telematics have received lots of attention from industrials and academics. The more cars we have, the more traffic accidents have happened to damage peoples' life and properties. In this study we propose a new method of detecting the dangerous driving behaviors. In this work, three-axis accelerometers are used for measuring accelerated variation of three different axes, a ZigBee wireless sensor network is used for transmitting sensing data in this system to a tablet PC. For more accurate of identifying driving behavior of this system, an On Board Diagnostics Phase2 (OBD-II) is applied for capturing driving speed to adjust parameters accordingly. The results of experiments show this method able to identify driving behaviors with more accuracy rate. In comparison with previous work, the proposed scheme presents up to the accuracies of 91.2% and 90.6%, in conditions of downtown road and highway, respectively.

Keywords：Zigbee, Accelerometer, OBD-II, Driving behavior detection

E01-05

整合雲端聲控OBD-II與Google Maps之車載即時最佳路徑規劃與線上導航系統實作

The design and implementation of optimal real-time route planning and on-line navigation system embedded cloud computing voice-controlled interface, OBD-II, and Google-Maps technologies

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中文摘要

本研究計畫為總計畫『結合雲端運算之創新車載資通訊系統與應用服務平台之研發與實作』中的第四個子計畫，其研究目的在於建構一套以雲端聲控技術結合 OBD-II 與 Google Maps 之車載即時最佳路徑規劃與線上導航系統，同時提供總計畫以及其他子計畫所需之聲控人機介面。本子計畫採用目前極為熱門的雲端計算技術，將語音辨識、OBD-II 即時行車狀況與 Google Maps 最佳路徑規劃等需要大量運算與資料庫比對之工作，透過寬頻無線網路轉交由雲端伺服器處理，最後再將運算結果回傳至車載資通訊主機為使用者提供線上導航服務。在雲端語音辨識方面，使用者啟用聲控功能後，其語音信號將先轉換成第三代(3G)語音通訊標準之適應性多重位元率(AMR)語音編碼格式，然後再回傳至雲端伺服器進行語音辨識，本研究計畫研發出一套可直接從 AMR 語音編碼格式中擷取語音特徵參數並進行語音辨識的技術，藉以提升語音辨識運算效率與準確度。同時本計畫採用探針車的概念，使用者的車載資通主機將會把車上的 OBD-II 車輛運轉信號、GPS 座標、目的地(語音指令)與路徑規劃選項(語音指令)等訊息上傳至雲端伺服器，雲端伺服器將統合道路上其他車輛所回報之即時路況與經驗路徑訊息後，再將即時最佳路經規劃結果以 Google Maps 形式通知使用者。因此，使用者不需要在其車上的車載資通主機安裝語音辨識軟體或是衛星導航軟體，便可達成聲控線上導航與最佳路徑規劃的目標，並且可降低車載資通訊平台的成本與體積。

本計畫執行相關成果已發表在 ICGEC-2010、ICGEC-2011、IMIS-2011、2011 數位生活科技研討會、2011 電子通訊與應用研討會等會議，並參加 2011 全國電子創意競賽與 2011 教育部嵌入式系統設計競賽分別獲得第二名與設計完整獎，本計畫後續將把所得之成果彙整投稿至國際車載資通訊相關期刊。

關鍵詞：雲端運算、語音聲控介面、OBD-II、Google Maps、探針車

Abstract

This project is belonged to the fourth subproject of the main project: “The development and implementation of an innovative telematics and application service platform combined with cloud computing.” The goal of this project is to develop an optimal real-time route planning and on-line navigation system using cloud computing voice-controlled interface, OBD-II, and Google-Map technologies. This project makes use of cloud computing to perform the complicated tasks, e.g., speech recognition and optimal route planning. The speech signal will be transferred into AMR format and then submit to the speech recognition system built in the cloud computing service. The proposed system can directly extract the speech features from AMR bit stream and carries out accurate speech recognition results. Meanwhile, the project adopts the concept of probe vehicle. The vehicle equipped with the proposed on-board telmatics platform will consistently report its OBD-II data, GPS coordinates, destination, and navigation options to the cloud computing service. Therefore, the cloud computing service can determine an optimal real-time route planning based on the immediate traffic information reported from probe vehicles. Finally, the route planning result will be transmitted to user in the form of Google Maps. The main advantage of the proposed system is that users do not need to install any speech recognition software or navigation program in their on-board telmatics platforms before using the proposed voice-controlled on-line navigation system. This will also benefit the cost and size reduction of the on-board telmatics platform.

The related research results of this project have been published at ICGEC 2010, ICGEC 2011, IMIS-2011, 2011 Symposium on Digital Life Technologies, and 2011 Conference on Electronic Communication and Applies. In addition, this project attends 2011 National Electronic Originality Competition and 2011 Embedded System Design Contest, and obtains the second prize and the design completed award. This project will further submits the related results to international telematics journals.

Keywords: Cloud Computing, Speech-Controlled Interface, OBD-II, Google Maps, Probe Car.

E01-06

情緒語氣辨識 SOC 模組設計與實現(I)

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中文摘要

本研究計畫為總計畫『整合語者、語氣、N-Best 情緒關鍵詞辨識之情緒感知與回饋之 SOC 系統單晶片設計與實現』中的第三個子計畫，其研究目的在於為總計畫的情緒感知與回饋 SOC 單晶片系統提供說話者情緒語氣辨識之 SOC 模組，本計畫研發的情緒語氣辨識 SOC 模組將可辨識正面、負面、反諷、中性等四大類型語氣，包括喜樂、憤怒、悲哀、恐懼、擔心、厭惡、輕鬆、無聊、疲倦、緊張、中性等 11 種情緒語氣辨識結果。為了達成多種情緒語氣類之高辨識準確率，本計畫將採用音高週期輪廓(Pitch Contour)、共振峰(Formant)、梅爾倒頻譜係數(MFCC)、次頻帶能量值(Subband Energy)與 MPEG-7 音訊特徵等情緒語氣特徵參數，配合混合式高斯混合模型(GMM)與支撐向量機(SVM)之 Hybrid GMM-SVM 分類器完成情緒語氣識別工作。除了針對情緒語氣辨識演算法的創新研究之外，本計畫同時著重情緒語氣辨識 SOC 模組設計與實現，運用總計畫所提供的可重組式硬體運算模組，本計畫將建構出計算速度快且低耗能的情緒語氣特徵擷取模組與情緒語氣分類器，在總計畫整合情緒關鍵詞辨識技術的協助之下，預計可達成 90%以上之情緒語氣辨識效能，並將其實作在 SOC 單晶片系統中。

本計畫原先預定分三個年度執行完畢，不過由於計畫僅核定通過一年的經費，因此本計畫僅就情緒語氣辨識之演算法設計與實現進行研究，此部份的工作包含情緒語音資料庫建置、情緒語氣特徵參數擷取與情緒語氣分類器實作，本計畫將採用小波轉換(Wavelet Transform)與傅立葉轉換(Fourier Transform)求取諸如音高週期輪廓、共振峰、梅爾倒頻譜係數、次頻帶能量值與 MPEG-7 音訊特徵(包含 Spectrum Centroid、Spectrum Spread、Spectrum Flatness)等情緒語氣特徵參數，接著再採用 Hybrid GMM-SVM 分類器完成情緒語氣識別工作。除了完成 180 組情緒語氣資料庫建置之外，相關研究成果已發表在 e-CASE & e-Tech 2012 以及 ISCAS 2012 等國際研討會中。

關鍵詞：情感運算、情緒語氣特徵、情緒語氣辨識、SOC設計與實現

Abstract

This project is the third subproject of the main project entitled “SOC Design and Implementation Based on Integration of Speaker, Acoustics-Based Emotion Speech, and N-Best Emotion Keyword Recognition for Emotional Cognition and Feedback.” The objective of this project is to develop an SOC module with the function of acoustics-based

emotional speech recognition for the emotional cognition and feedback SOC chip proposed in the main project. The SOC module developed in this project could recognize various types of positive, negative, sarcastic, and neutral emotions. These emotional speeches include joy, angry, sad, fear, worried, disgusted, relaxed, boring, tired, nervous, and neutral emotions. In order to increase the recognition rate of various emotional speeches, this project will make use of pitch contour, formant, MFCC, subband energy, MPEG-7 audio features, and hybrid GMM-SVM classifier to achieve the task of emotional speech recognition. In addition to novel study on the emotional speech recognition algorithm, this project will also design and implement the SOC module for acoustics-based emotional speech recognition. By the use of reconfigurable hardware computation module provided by the main project, this project will build up fast and low-power consumptive modules for emotional speech features extraction and classifier. Under the assistance supported from the main project, the proposed SOC emotional speech recognition module expected to reach 90% of accurate rate in emotion recognition.

This project is originally planned for the three-year project. However, due to NSC only approved one-year budget for this project, this project just could focus on the design and implementation of the emotional speech recognition algorithm. These tasks include construction of emotional speech database, extraction of emotional speech features, and implementation of emotional speech classifier. This project will make use of wavelet transform and Fourier transform to extract various emotional speech features, such as pitch contour, formant, MFCC, subband energy, MPEG-7 audio features (include spectrum centroid, spectrum spread, spectrum flatness). Then one can use hybrid GMM-SVM classifier with these emotional speech features to perform the emotional speech recognition. In addition to set up an emotional speech database that contains 180 emotional speech clips, the related research results are published in e-CASE & e-Tech 2012 and ISCAS 2012.

Keywords: affective computing, emotional speech feature, acoustics-based emotional speech recognition, SOC design and implementation.

E01-07

以整合式服務遷徙提升無線行動網路服務品質(III)

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中文摘要

從有線網路到無線網路、從區域無線網路到都會無線網路，隨著WiMAX、LTE 等中長程第四代無線接取技術的崛起，無線行動網路將是未來必然的趨勢。無線行動網路最大的訴求在於隨時、隨地上網，並於不同網域間遊走之際，仍能持續享有進行中的服務。此一願景將面對諸多挑戰，以往相關研究均著重於客戶端的平順交遞程序，本計畫除了在此議題做進一步改良外，更將提出一個全新的服務架構概念-服務遷徙。本計畫所擬的服務遷徙包含三大模組：近接管理模組、遷徙決策模組以及服務遷徙模組。透過服務遷徙模組在不同網路層級的設計與實現，包含應用層、IP/UDP 層與IP/TCP層。而在近接管理模組與遷徙決策模組的設計與實現中，涉及諸多網路服務品質的監測、收集與資訊交換。並於改良媒體存取控制層之交遞機制，將原本分段進行的交遞程序與服務遷徙整合，畢其功於一役，藉以縮短交遞與服務遷徙時的服務暫停時間。本計畫以數位內容的遞送作為主要的應用情境，針對各項關鍵性議題做進一步探討與研究，最終目標在於提出整合性的解決方案，並提供一個極具潛力的應用典範。

關鍵詞：無線行動網路、整合式服務遷徙、服務品質

Abstract

From wired to wireless, from WLAN to WMAN, mobile wireless networks have become a definite trend of computer networking, in particular with the rise of next generation wireless access technologies, such as WiMAX and LTE. Users strongly demand to keep connected anywhere, anytime, and to retain ongoing services on the move. Such a vision will be confronted by a number of technical challenges. Previous studies mainly focus on seamless handover. This study will contribute to the provisioning of QoS in mobile wireless network from a different perspective. The proposed framework consists of three main modules, namely Proximity Management Module, Migration Decision Module, and Service Migration module. First, We accomplish the design and implementation of the migration module at different layers - including application-layer, IP/TCP layer, and IP/UDP layer. And the design and implementation of the proximity management module and the migration decision module is in progress. Considerable amount of information regarding connection quality and system parameters is essential for a successful implementation. Final, service migration including improved handover at media access control layer and integrated handover. The integrated handover – service migration consider a new signaling scheme which conducts client handover and service migration jointly at the same time. It can be expected that service disruption period during the handover/migration can be greatly reduced.

Keyword: Mobile Wireless Network, Integrated Service Migration, Quality of Service

E01-08

應用於感測節點之重複事件資訊彙集與統合演算法

計畫主持人：國立高雄應用科技大學 電子工程學系 潘正祥

中文摘要

本論文提出一重複事件彙集演算法(Reduce Identical Event Transmission Algorithm, RIET)，應用於無線感測網路，若有多個感測節點同時偵測到同一事件，則相關節點將藉由該演算法決定，由哪一個節點負責傳送事件資訊回目的端節點，藉以減少重複的事件傳遞，進而減少節點的能量消耗。由模擬實驗可知，重複事件彙集演算法相較於傳統演算法，最高可提高 12.9 倍的節點存活率，及節省高達 52.43%的能量消耗。

關鍵詞：無線感測網路、感測節點、重複事件彙集演算法、GD 演算法

Abstract

This paper proposed a Reduce Identical Event Transmission Algorithm (RIET). The al-gorithm can decide that which sensor nodes could send the event to sink node when sensor nodes sense a same even. Moreover, other nodes can save power because they didn’t send the same event. In our simulation, the RIET algo-rithm can enhance sensor nodes’ life time about 12.9 times and saving power cons0umption about 52.43% than tradition algorithms.

Keywords: Wireless Sensor Network、Sensor Nodes、Reduce Identical Event Transmission Algorithm、Grade Diffusion Algorithm

E02-01

Semantic Frame-based Natural Language Understanding for Intelligent Topic Detection Agent

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Abstract

Detecting the topic of documents can help readers construct the background of the topic and facilitate document comprehension. In this paper, we proposed a semantic frame-based method for topic detection that simulates such process in human perception. We took advantage of multiple knowledge sources and identified discriminative patterns from documents through frame generation and matching mechanisms. Results demonstrated that our novel approach can effectively detect the topic of a document by exploiting the syntactic structures, semantic association, and the context within the text. Moreover, it also outperforms well-known topic detection methods.

Keywords: Topic Detection, Semantic Frame, Semantic Class, Partial Matching, Sequence Alignment.

Acknowledgement

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E02-02

A Novel Method for Extracting Aging Load and Analyzing Load Characteristics in Residential Buildings

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Abstract

This study proposes a Hellinger distance algorithm for extracting the power features of aging load based on a non-intrusive load monitoring system (NILM). Hellinger distance algorithm is used to extract optimal features for load identification and the back-propagation artificial neural network (BP-ANN) is employed for the aging load detection. The proposed methods are used to analyze and identify the load characteristics and aging load in residential building. The result of aging load detection can provide the demand information for each load. The recognition result shows that the accuracy can be improved by using the proposed feature extraction method. In order to reduce the consumption of energy and send a real-time alarm of aging load to the user, the system provides the information of energy usage from the data analyses.

Keywords: Non-intrusive load monitoring system (NILM), aging load detection, Hellinger distance, back-propagation artificial neural network (BP-ANN).

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E02-03

An Improved Liu's Ordering Theory Based on Empirical Distributive Critical Value

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Abstract

Since the Ordering Theory (OT) has only considered the item ordering relationship rather than the item non-independence, and the Item Relational Structure theory (IRS) has only focused on the item non-independence but no thought for the item ordering relationship, the first author of this paper proposed his improved theory, called Liu's Ordering Theory (LOT), which has considered both the item ordering relationship and item non-independence. However, all of the critical values of the ordering index of above-mentioned three theories are subjectively fixed numbers. In this paper, for overcoming the lack of statistical meaning, an empirical distributive critical value of the ordering index based improved LOT theory, denoted as ILOT, was proposed, this new theory is more reasonable and useful than OT, IRS and LOT. Furthermore, by using the new method ILOT, based on the theory of the ideal test proposed by the first author of this paper, we can construct the validity index of item ordering structure of any group of examinees to compare the performances of any different groups of examinees.
Keywords: Ordering relationship, non-independence, OT, IRS and LOT.

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E02-04

使用雲端 push service 建構一個訊息推播平台

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中文摘要

網路技術快速發展的今天配合智慧終端設備（智慧型手機，平板電腦）運算能力大幅提昇，造就雲端運算已是現在資訊服務的主流。人與人的訊息傳遞已是無所不在的進行中，簡訊及 e-mail 是現在訊息傳遞最常用的方式，網路上也有許多 P2P 的訊息傳遞服務，如 Skype, MSN, Line 等等。但是這些訊息傳遞的方式是固定的模式，許多的應用是需要客製化的傳遞多媒體資訊（文字，語音，影片等），透過行動裝置 APP 的設計，可以有多樣性的多媒體資訊傳遞服務。在網路上的資訊傳遞只有 Technology Push 及 Need Pull (簡稱 Push/Pull)兩種模式，本研究就是使用 Push/Pull 技術結合 Google C2DM 雲端推撥（Push/Pull）服務，建構一個通用型的推撥服務平台。C2DM 是 Google 所提供的免費雲端 Push/Pull 服務平台，只要建構一個 APP Server，並在 C2DM 註冊完畢後便可免費使用該項雲端服務。開發者可以依據不同的多媒體資訊傳遞需求，設計出不同的 APP 安裝在智慧手機或是平板電腦等智慧終端設備上，讓開發者可以進行客製化的多媒體訊息傳遞設計。訊息傳遞方式可以在線上及離線兩種模式下進行，讓資訊的傳遞更有彈性。目前這個通用型的推撥系統平台已建構完成，在上面的應用有行動英語教學，及農家好等，經過初步實驗，這個平台確實可以達到客製化多媒體資訊的傳遞的目的。

關鍵詞：Push service, 雲端服務，多媒體訊息

E02-05

應用變數分析探討頭頸癌在放射治療後發生口乾併發症機率之預測效力

Improving the prediction performance for the incidence of xerostomia after radiotherapy using the variables analysis in head and neck cancer

計畫主持人：國立高雄應用科技大學電子工程學系 李財福

中文摘要

應用單變數分析預測頭頸部癌症患者在放射治療後三個月與十二個月後影響口乾症之重要參數。本研究採用 206 位接受強度調控放射治療(Intensity Modulation Radiation Therapy, IMRT)頭頸癌，使用 EORTC QLQ-H&N35 及 EORTC QLQ-C30 問卷分別探討放射治療後三個月與十二個月口乾症的嚴重程度，自助法分別推論遺漏資料與去除樣本極端值，並排除治療前已有中-重度口乾之樣本預後因子選取採用單變數邏輯斯分析，將選取預後因子使用邏輯斯迴歸進行系統分析，最後根據模型配適度與模型預測效力檢定進行效能評估。在白氏得分法中 NPC 模型皆低於 0.130、HNSCC 模型皆低於 0.12 而 AUC 效能評估在 NPC_12m 與 HNSCC_3m 有最佳表現(0.92)。口乾預後因子可供治療計劃設計時之參考，進而提高頭頸癌病患口乾方面的健康生活品質。

關鍵詞：單變數分析，頭頸部癌症，口乾症，生活品質

Abstract

Application univariate analysis to predict the impact of head and neck cancer with xerostomia important parameters in the three months after radiation therapy and twelve months.In this study, 206 accepted IMRT (Intensity Modulation Radiation Therapy, IMRT) head and neck cancer patients.Using the EORTC QLQ-H & N35 and the EORTC QLQ-C30 questionnaire three months after radiation therapy were discussed with the twelve months of the severity of xerostomia.BootStrap each sample inference of missing data and removing outliers and excluded before treatment - severe xerostomia in the sample. Select prognostic factors using univariate logistic regression analysis, the selected prognostic factors using logistic regression analysis system, the final performance assessment based on the model and the model predictions with moderate potency test, in Brier-score method NPC models are less than 0.13, HNSCC models are less than 0.12 and the AUC performance assessment NPC_12m with HNSCC_3m has the best performance (0.92). After the opening of the intervention factor for reference when designing treatment plans, and to improve health quality of life in patients with head and neck cancer xerostomia area.

Keywords: xerostomia, quality of life (QoL), head and neck cancer (HNC), univariate analysis

E02-06

腫瘤控制率與正常組織併發症之 Lyman 模型分析平台
Lyman model analysis platform for tumor control probability and normal tissue complication probability

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中文摘要

為了提升在放射治療計畫研究對於正常組織併發症機率 (normal tissue complication probability, NTCP)與腫瘤控制率 (tumor control probability, TCP) 不同模型的評估效率，本研究建構創新放射治療計畫整合分析平台，提供更簡便的 TCP/NTCP 數據研究工具。本研究利用 MatLab 軟體設計開發可應用於一般個人電腦使用的多功能放射治療計畫分析平台，平台中包括 2 個主要部分：劑量-體積直方圖(dose-volume histogram, DVH)繪製與 NTCP/TCP 計算。本研究所設計開發出放射治療計畫正常組織併發症機率與腫瘤控制率分析平台，具有快速、簡便、價格低廉的優勢，幫助研究的進行，然而是否能供臨床實際應用，仍須進一步探討。

關鍵詞：劑量-體積直方圖，正常組織併發症機率，腫瘤控制率，等效均勻劑量

Abstract

To improve the investigation processing efficiency for the radiation therapy treatment planning evaluation for the normal tissue complication probability (NTCP) and tumor control probability (TCP) in different models, we construct an innovative platform that provides a more convenient environment for TCP/NTCP study. We developed a multi-functional platform by using MatLab software that could be run in a personal computer. The platform includes two parts: dose-volume histogram (DVH) plot and NTCP/TCP calculation. We found that our radiotherapy analytic platform is user friendly, easy to use, and can provide a convenient and cheaper environment for TCP/NTCP study. Whether such superiority in planning investigation could transfer into clinical advantages needs further study.

Keywords: dose-volume histogram (DVH); normal tissue complication probability (NTCP); tumor control probability (TCP); equivalent uniform dose (EUD).

E02-07

A GA-Based Approach to Efficient Resource Management of Virtual Machines in Clouds

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Abstract

In cloud computing, infrastructure as a service (IaaS) is a growing market that enables users to access cloud resources in the convenient, on-demand manner. IaaS provides user to rent the resources of cloud computing and virtual machines (VMs) through virtualization technology. When different VMs demand different amounts of resources from a set of physical resources, how to decide the resource consolidation adaptively to satisfy the resource needs of VMs is an important problem addressed in this paper. The consolidation is formulized as a mapping problem called virtual machine placement policy (VMPP). However, VM will change the requirement of resources according to the workload of application VM. Thus, it's necessary to apply resource consolidation technology to satisfy dynamically resource on demand. In this thesis, we present a two-phase approach for resource consolidation to minimize resource consumption. In the first phase, we use a genetic algorithm to find a reconfiguration plan. In the second phase, we propose a mechanism to find a way to migrate VMs such that the number of active nodes and the overall migration cost could be minimized. Finally, the experimental results show that we obtain well-consolidating active nodes than other existing approaches.

Keywords: Resource consolidation, VM migration, Cloud computing, Genetic algorithm

E02-08

智慧型互動居家用電管理系統及其軟硬體平台之開發

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摘要

本研究開發一個智慧型居家用電源管理系統，其目的是為了改善現有居家用電安全與節能的效益，提供智慧後端服務。主要是實作一個智慧安全節能裝置、異質網路閘道器與用電管理平台。智慧安全節能裝置具有聯網功能、主動與被動控制供電及斷電功能、自動電器識別及偵測功能、感測電器訊號功能與裝置狀態偵測功能。當家中的每項電器將接上本研究所開發的智慧安全節能裝置，利用電器訊號感測功能與聯網功能可以達到正確的電器用電資訊蒐集。另外，智慧安全節能裝置本身具有主動與被動控制供電及斷電功能，可自行判斷裝置是否異常而自動控制裝置斷電，同時使用者可以利用聯網裝置對指定電器進行立即控制或定時控制的操作。本研究所實現的智慧安全節能裝置，不須改變現有電源插座與電器插頭，具有簡易安裝的特性。在軟體與人機介面的設計上，考量人性化與互動式的呈現方式，具有簡單使用的特性。未來本研究所開發的電源管理系統將具有不能忽視的市場發展潛力與商機。

關鍵字:居家用電管理技術、智慧安全節能裝置、異質感測閘道器、Android

Abstract

In this paper, a smart interactive electricity management system including Smart Safe Saving Device, heterogeneous sense network gateway and electricity management system are developed. This developed system provides smarter software services to improve the efficiency of safe and energy-saving electricity. The appliances are able to connect network, detect appliance states, and manage the electricity supply by Smart Safe Saving Device. These Smart Safe Saving Device can collect the electricity information of appliance to form the power map of home. Besides, the Smart Safe Saving Device does not need the change of original sockets and appliances. The proposed electricity management system has many development opportunities and potential for markets.

Keywords: electricity management, smart safe saving device, heterogeneous gateway, Android