

出國報告（出國類別：國際會議）

出席 2015 International Conference on
Advanced Manufacturing and Industrial
Application(ICAMIA2015)國際會議
發表論文報告書

服務機關：國立高雄應用科技大學

姓名職稱：許博淵 助教

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摘要

參加 2015 年 12 月 20 日至 21 日於泰國普吉島所舉辦的 ICAMMIA 2015 國際會議，該會議主要從世界各地匯集先進製造和工業應用研究人員的文章，提供一個高素質的平台，讓大家分享最新的研究結果，計有日本、韓國、法國、土耳其、印度、印尼、泰國及台灣等多位學者共同參與。本人在會議中上台發表「Evaluation of Particle Swarm Optimization Factors Using Gray Situation Decision-Making Model」論文，獲得與會人員的認同，未來將繼續朝類水筒模式（para-tank model, PTM）、粒子群優法（particle swarm optimization, PSO）及灰局勢決策（gray situation decision-making, GSDM）三種模式的應用來研究發展，期能為土木工程貢獻自己的一份心力。

關鍵詞：類水筒模式、粒子群優法、灰局勢決策

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一、目的

參加 2015 International Conference on Advanced Manufacturing and Industrial Application(ICAMIA2015)國際會議主要將自己多年研究的成果，藉由國際會議上的發表，讓各國學者了解新發開的水文類水筒模式（ para-tank model, PTM），配合粒子群優法（ particle swarm optimization, PSO）及灰局勢決策（ gray situation decision-making, GSDM）方法，將其整合並應用土木工程領域中，獲得大會的認可及與會的各國學者認同。

二、過程

(一) 發表內容摘要

本研究將其應用於降雨-逕流模式的類水筒模式(Para-Tank Model, PTM)中，在以粒子群優法(Particle Swarm Optimization, PSO)尋找參數的過程時，將其速度方程式下的三個因子：加速常數(Acceleration Constants) c_1 和 c_2 及慣性權重(Inertia Weight) w 作為事件，採 0.2、0.5、0.8 的值為其對策，形成 27 組局勢集，對均方根誤差(Root mean squared error, RMSE)及效益係數(Coefficient of Efficiency, CE)二種目標決策指標做統一測度效果的分析，比較綜合效果測度後，以 $c_1=0.2$ 、 $c_2=0.8$ 、 $w=0.2$ 時綜合效果測度最高為最佳的決策，成為 PSO 在尋找類水筒模式參數值時的因子最佳值。

This study investigates three factors of the acceleration equation, i.e., acceleration constants c_1 and c_2 and inertia weight w , which are then used as events in particle swarm optimization for parameter optimization in the para-tank model (PTM) during rainfall-runoff simulation. The values of 0.2, 0.5, and 0.8 are respectively used to create 27 groups of situation sets using the indices of the two decision-making objectives, root mean squared error and coefficient of efficiency, in order to analyze the systematic effectiveness. After comparing the comprehensive effect measures, an optimal decision is reached when the combined effectiveness was at the highest when $c_1 = 0.2$, $c_2 = 0.8$, and $w = 0.2$ and becomes the optimal parameter value for the PTM.

(二) 現場報告或討論交流情形



日本專家學者(Kakuro Amasaka)專題演講



上台發表論文



各國專家學者討論交流

三、心得及建議事項

本次會議各國專家學者對於先進製造和工業應用的議題，充分交換自己的研究心得，會中的討論更讓與會者了解各項領域先進的技術及研發成果，達到學術交流的目的。對於工業 4.0 的到來，各工業領域的專家學者應當思考未來如何改變專業上的創新與研究，勿再拘泥於自己的領域中，將其他跨領域的技術導入是未來的課題。

國際研討會的舉辦應在國內多多的舉辦，有助於各國學者間來到本地專業的交流，也可大大提昇青年學子在地學習的機會，避免出國旅費昂貴及經費補助短缺下造成負擔，並可促進國內的觀光旅遊業，提高經濟產能，泰國能如此，本國亦可比照效仿之。

工業 4.0 革命是現在全球各個國家積極努力的方向，各領域的學者專家如何將其技術導入自己的研究領域中是新的課題，如果能對於各不同專業領域因應工業 4.0 革命舉辦在地型國際型研討會，藉此多方吸吸國外專家學者的新研究後，再積極發展自己的特色，會是一項很好的選項，也是給國內學子更多國際化的學習機會。

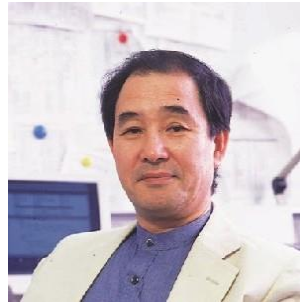
附錄

A. 會議議程：

December 20, 2015		
09:30-12:00	Conference Registration	Lobby Cape Panwa Hotel
14:00-17:00	Conference Registration	
Morning, December 21, 2015		
09:00-09:15	Open Ceremony	Tamarind Bay room Cape Panwa Hotel
09:15-10:00	Keynote Speech <i>Prof. Kakuro Amasaka</i>	
10:00-10:15	Coffee Break	
10:15-12:00	Oral Session 1 <i>ICISME2015</i>	
12:00-13:00	Buffet Lunch	Café Andaman Cape Panwa Hotel
Afternoon, December 21, 2015		
14:00-18:00	Oral Session 2 <i>ICAMIA2015, ICEEM2015 & GMEE2015</i>	Tamarind Bay room Cape Panwa Hotel
15:00-15:15	Coffee Break	

B. 專題演講學者

TITLE: Global Manufacturing Strategy of New JIT: Surpassing JIT



Speaker: Prof. Kakuro Amasaka

Graduate School of Science and Engineering, Aoyama Gakuin University, Japan

Time: 09:15-10:00, December 21, 2015

Location: Tamarind Bay room, Cape Panwa Hotel

Abstract

The author deems it necessary to establish an advanced model of a new management technology toward renovation of manufacturing fundamentals surpassing JIT for all the business processes of each department from upstream to downstream. In order to offer customers high-value-added products and prevail in the worldwide quality competition, it is necessary to establish an advanced production system that can intellectualize the production engineering and production management system. Given this context and by predicting the form of next generation manufacturing, the author develops New JIT, new management technology principle for manufacturing in the 21st century. The aim of this study for global manufacturing strategy is to reassess the way management technology was carried out in the manufacturing industry and establishes “New JIT, New Management Technology Principle”, surpassing JIT. New JIT consists of the Total Development System (TDS), the Total Production System (TPS) and the Total Marketing System (TMS). Furthermore, as the key to global manufacturing strategy of New JIT, the author believes that the effectiveness of New JIT using High Linkage Model “Advanced TDS, TPS & TMS” for expanding “uniform quality worldwide and production at optimum locations”. The validity of New JIT is then demonstrated at Toyota and others.

Brief Biodata of Prof. Kakuro Amasaka

Dr. Kakuro Amasaka was born in Aomori Prefecture, Japan, on May 5, 1947. He received a Bachelor of Engineering degree from National Institute of Technology, Hachinohe College, Hachinohe, Japan, in 1968 and a Doctor of Engineering degree specializing in Precision Mechanical and System Engineering, Statistics and Quality Control from Hiroshima University, Japan, in 1997.

Since joining Toyota Motor Corporation, Japan, in 1968, Dr. Amasaka worked as a quality control (TQM and SQC) consultant for many divisions. He was an engineer and manager of the Production Engineering Division, Quality Assurance Division, Overseas Engineering Division, Manufacturing Division and TQM Promotion Division (1968-1997), and the General Manager of the TQM Promotion Division (1998-2000). Dr. Amasaka became a professor of the School of Science and Engineering, and the Graduate School of Science and Engineering at Aoyama Gakuin University, Tokyo, Japan in April 2000. His specialties include: production engineering (Just in Time, JIT and Toyota Production System, TPS), probability and statistics, multivariate statistical analysis, reliability engineering and information processing engineering. Recent research conducted includes: "Science SQC, new quality control principle", "Science TQM, new quality management principle", "New JIT, new management technology principle", "Customer Science", "Kansei Engineering" and numerical simulation (Computer Aided Engineering, CAE).

Positions in academic society and important posts: He is the author of a number of papers on strategic total quality management, as well as the convener of JSQC (Journal of Japanese Society for Quality Control), JOMSA (Japanese Operations Management and Strategy Association), JIMA (Japan Industrial Management Association), JSKE (Japan Society of Kansei Engineering), and other academic society (e.g. POMS and EurOMA). He has been serving as the vice chairman of JSPM (2003-2007) and JOMSA (2008-2010), the director of JSQC (2001-2003), the chairman of JOMSA (2011-2012), and the commissioner of the Deming Prize judging committee (2002-2013). Now, he is inaugurated as the representatives of JOMSA establishment (2008-present). Patents and prizes: He acquired 72 patents concerned with production and quality control systems, and engineering and measurement technology. He is a recipient of the Aichi Invention Encouragement Prize (1991), Nikkei Quality Control Literature Prizes (1992, 2000, 2001 and 2010), Quality Technological Prizes (JSQC, 1993 and 1999), SQC Prize (Union of Japanese Scientists and Engineers, 1976), JSKE Publishing Prize (2002), and others (e.g. Outstanding Paper Award, ICMIS-2013).