

出國報告（出國類別：出席國際會議）

**2016 年農業與生物系統工程機電國際學術
會議 (2016 ISMAB)**

服務機關：國立嘉義大學

姓名職稱：連振昌 教授

派赴國家：日本

出國期間：2016 年 05 月 22日至28 日

報告日期：2016 年 05 月 30 日

摘 要

農業與生物生產系統機電整合國際學術會議 (International Symposium on Machinery and Mechatronics for Agricultural and Biosystems Engineering, ISMAB) 係由臺灣、日本和韓國三個國家之農業機械學會，於 2000 年共同協議輪流舉辦之學術會議。該學術會議每隔兩年舉行一次，主要與會人員以臺日韓三國農機學會會員為主，會議舉辦時間和地點由輪值國決定。ISMAB 的主要目的為提供學術交流平台，供臺日韓三國農機相關之產學界專家發表研發成果，促進各國間之合作研究工作及國際友誼。

因應各國農機科系之轉型發展，歷年來在 ISMAB 發表之論文除了傳統農機領域之田間動力農機具，及收穫後農產及食品加工處理機之外，亦包括整合性科技例如機電整合技術、感測科技、資訊與電機、系統工程、精準農業、生物與再生能源、生物機電與機器人、食品安全、設施與環境工程、廢棄物處理、生物技術和畜產、漁業養殖及醫學工程等領域。

2016 年農業與生物生產系統機電整合國際學術會議 (International Symposium on Machinery and Mechatronics for Agricultural and Biosystems Engineering, 2016ISMAB)，此會議是由日本農機與食品工程學會主辦，開會地點在日本新潟朱鷺 (TPKI MESSE) 新潟會議中心，會議期間：105 年 05 月 23-25 日。本出國計畫為出席找運用計畫管理費款項之經費，將執行計畫的研究成果，研提論文於該會議中報告發表與交流。會中下列人員將發表論文：連振昌、林正亮、秦宗顯、郭世榮、張心怡、楊朝旺、洪滉祐、黃光亮、黃建政、黃文祿及朱建松，計有 11 位老師。

關鍵詞：國際學術會議、生物機電、機電整合、農業機械學會、新潟朱鷺

目 次

	頁次
壹、計畫緣起與目的	1
貳、參加研討會過程與內容	2
參、心得與建議	10

壹、計畫緣起與目的

農業與生物生產系統機電整合國際學術會議(International Symposium on Machinery and Mechatronics for Agricultural and Biosystems Engineering, ISMAB) 係由臺灣、日本和韓國三個國家之農業機械學會，於 2000 年共同協議輪流舉辦之學術會議。該學術會議每隔兩年舉行一次，主要與會人員以臺日韓三國農機學會會員為主，會議舉辦時間和地點由輪值國決定。ISMAB 的主要目的為提供學術交流平台，供臺日韓三國農機相關之產學界專家發表研發成果，促進各國間之合作研究工作及國際友誼。

因應各國農機科系之轉型發展，歷年來在 ISMAB 發表之論文除了傳統農機領域之田間動力農機具，及收穫後農產及食品加工處理機之外，亦包括整合性科技例如機電整合技術、感測科技、資訊與電機、系統工程、精準農業、生物與再生能源、生物機電與機器人、食品安全、設施與環境工程、廢棄物處理、生物技術和畜產、漁業養殖及醫學工程等領域。

第一屆會議 (ISMAB2002) 於 2002 年 11 月 3 日至 7 日在臺灣嘉義市國立嘉義大學召開，由該校生物機電工程學系負責籌劃。本次學術會議提供世界各國農業與生物生產系統機電整合之研究人員交換彼此的研究成果與經驗，與會者來自產官學界，總計參與人數：國內約 140 人，國外約 60 人分別來自日本、韓國、美國、英國、馬來西亞、泰國、德國、沙烏地阿拉伯，共發表 74 篇論文演講與 19 篇海報展示。會議並安排 7 場專題演講，其中含蓋農業機械發展、食品科技、生物奈米技術、與生醫工程，此安排使與會者了解『農業機械』至『機電整合』的演化，並進而應用於『生物系統』的概念。

第二屆會議 (ISMAB2004) 於 2004 年 9 月 21 日至 23 日在日本神戶大學召開，由該校生物系統工程學系負責主辦。第三屆會議 (ISMAB2006) 於 2006 年 11 月 23 日至 25 日在韓國首爾市世貿中心 (COEX) 召開，由韓國農業機械學會負責主辦。第四屆會議 (ISMAB2008) 於 2008 年 5 月 27 日至 29 日在臺灣臺中市國立中興大學舉辦，主辦單位為中興大學生物產業機電工程學系。第五屆會議 (ISMAB2010) 於 2010 年 4 月 5 日至 7 日在日本九州福岡市九州大學舉辦。第六屆會議 (ISMAB2012) 於 2012 年 6 月 18 日至 20 日在韓國全州 (Jeonju) 市全北大學 (Chonbuk National University) 舉辦。第七屆會議 (ISMAB2014) 將於 2014 年 5 月 21 日至 23 日在臺灣宜蘭市國立宜蘭大學召開，本屆主辦單位為宜蘭大學生物機電工程學系。歷年來，各國皆以不落人後心態承辦 ISMAB，因此該會議 12 年來之盛況、參與人數、發表論文篇數及成果，一年勝過一年。

ISMAB 在臺灣舉辦時，其負責籌劃單位由臺灣各大學農機相關學系接力擔任。臺灣承擔之校系依次為 2002 年國立嘉義大生物機電工程學系，2008 年國立中興大學生物產業機電工程學系，2014 年國立宜蘭大學生物機電工程學系。ISMAB 每隔六年重返臺灣乙次，每次

皆由臺灣農機學會協調相關校系輪流籌劃事宜。依此原則，2020 年將由國立屏東科技大學生物機電工程系籌辦，2026 年將由國立臺灣大學生物產業機電工程學系籌辦。臺灣農機學會和國立臺灣大學農業機械工程學系（2001 年更名為生物產業機電工程學系）曾於 1997 年 11 月 17 日至 22 日在台北市世貿中心國際會議中心召開農業機械化與自動化國際研討會（International Symposium on Agricultural Mechanization and Automation, ISAMA97），相當於 ISMAB 前身。

2016 年農業與生物生產系統機電整合國際學術會議（International Symposium on Machinery and Mechatronics for Agricultural and Biosystems Engineering, 2016ISMAB），此會議是由日本農機與食品工程學會主辦，開會地點在日本新潟朱鷺（TPKI MESSE）新潟會議中心，會議期間：105 年 05 月 22-24 日。本出國計畫為出席找運用計畫管理費款項之經費，將執行計畫的研究成果，研提論文於該會議中報告發表與交流。會中下列人員將發表論文：連振昌、林正亮、秦宗顯、郭世榮、張心怡、楊朝旺、洪滉祐、黃光亮、黃建政、黃文祿及朱建松，計有 11 位老師。

貳、參加研討會過程與內容

一、會議議程及議場主題

第八屆農業機械生物機電與系統工程國際學術研討會議『The 8th International Symposium on Machinery and Mechatronics for Agricultural and Bio-systems Engineering (簡稱 ISMAB2016)共有 14 個專業領域，如生物工程(Biological Engineering)、農業生物機電與機器人(Biomechatronics & Robotics in Agriculture)、田間動力機械(Farm Power & Machinery)、精準農業(Precision Agriculture)、食品工程(Food Engineering)、收穫後技術(Postharvest Technology)、食品安全(Food Safety)、結構與環境技術(Structure & Environmental Technology)、生質與再生能源(Bioenergy & Renewable Energy)、廢棄物處理(Waste Management)、綠色技術(Green Technology)、資訊與電子(Information & Electronics)、感測技術(Sensor Technology)、一般領域(General Aspects)。參與 ISMAB2016 論文發表會，除了農業機械與生物機電研究領域之外，各國專家學者都積極的從事於新興科技的研究，如微奈米科技、生醫工程和感測技術的開發。在生物機電未來的研究上，運用新興科技是生物機電工程人員必須著墨的範疇。

2016 年農業與生物生產系統機電整合國際學術會議（International Symposium on Machinery and Mechatronics for Agricultural and Biosystems Engineering, 2016ISMAB），此會議是由日本農機與食品工程學會主辦，開會地點在日本新潟朱鷺（TPKI MESSE）新潟會議中

心，會議期間：105 年 05 月 23-25 日。所有投稿發表論文都被同行審查和評估其原創性，學術性和研究內容及深度。此次會議為期三天，大會從 105 年 05 月 23 日上午 8 點 30 分到下午 5 點 45 分報到，5 月 23 日上午 9 點 30 分開始進行開幕，之後邀請韓國、臺灣、日本、義大利及土耳其分別報告該國的農業機械的發展狀況及未來發展（如附件一），下午開始四場次的分組議場的論文主題口頭發表（摘錄如附件二），5 月 24 日上午從 9 點 30 分到 12 點，下午從 2 點 30 分到 5 點 30 分，有四場次的分組議場的論文主題口頭發表（摘錄如附件三），而論文壁報發表時間為 5 月 23 日及 5 月 24 日下午從 1 點 15 分到 2 點（如附件四），其中口頭發表的論文篇數有 127 篇，壁報發表的論文篇數有 117 篇，合計論文篇數有 244 篇。所有出席參與者的論文發表過程順利，發表論文的摘要內容如（附錄一），論文發表者除了臺灣外，主要有來自日本、韓國、泰國等國。

5 月 25 日大會安排參觀日本株式會社久保田(KUBOTA)公司，其創立於 1890 年，作為日本最大的農機製造商，長期以來在“水”、“土”、“環境”、“城市”、“居住”等與人類生活和文化息息相關的五大事業領域中，不斷開發符合時代要求的先進技術和產品，為人類富裕美好的生活積極創造基礎。目前在農業機械（聯合收割機、插秧機、拖拉機）、小型建機、小型柴油發動機、鑄鐵管等領域處於世界前列。發動機製造方面，久保田擁有 85 年的生產經驗，累計銷售超過 2600 萬台，在中小馬力發動機領域具有壓倒性的優勢地位；在小型挖掘機製造方面，久保田幾十年專注於小挖的研發和製造，從 0.5 噸-6 噸，共 33 個機種，年銷量達 23000 台，累計銷量達到 280000 台，連續多年小挖全球銷量第一，始終以市場實績和品質優勢成為全球小挖行業的領跑者！

該公司主要為農業機械方面的研究，參觀的實驗室包括曳引機及引擎動力檢驗測定室、農產加工機械研發中心、田間機械研究室。該所於參觀當日陳列上述各領域在近年來所研發之農機。一般而言，其研究成果品質甚高，頗多值得國內學習借鏡的地方。之後走訪新潟縣的鄉村與其鬧區。由此參訪中，可以感受到日本在研究發展與都市建設的用心。大力投資研發，以其與世界先進國家並駕齊驅；在都市建設上，力求經濟發展的同時，也提供人民良好的生活品質以及文化遺產的保護。



Opening Ceremony and Plenary Session

<p>[Marine Hall] Opening Ceremony Date: May 23 9:30 - 9:45 Chairperson: Prof. Toru Torii, The University of Tokyo, Japan Opening address: Prof. Seichi Oshita, The University of Tokyo Welcome speech: Prof. Toshitaka Uchino, Kyushu University</p>	
<p>[Marine Hall] Plenary Session Date: May 23 9:45- 12:00 Chairperson: Prof. Kenji Imou, The University of Tokyo, Japan</p>	
Time No.	Title
9:45 H-1	<p>Recent Progress of Agricultural Machinery in Korea Prof. Chang Hyun Choi, President of KSAM, Dept. of Bio-Mechatronic Engineering, College of Biotechnology & Bioengineering, Sungkyunkwan University, Korea</p>
10:05 H-2	<p>The Development of Agricultural Machinery in Taiwan for the Future Prof. Peng-Kwei Lei, President of CIAM, Dept. of Bio-Industrial Mechatronics Engineering, National Chung Hsing University, Taiwan</p>
10:25 H-3	<p>Quality Preservation and Safety Control Technique for Agricultural Produce Prof. Toshitaka Uchino, President of JSAM, Faculty of Agriculture, Kyushu University, Japan</p>
11:15 H-4	<p>Mechanization in Post-Harvest Systems in Developing Asian Countries Dr. Rosa Sonya Rolle, Food and Agriculture Organization of the United Nations, Italy</p>
11:35 H-5	<p>Agricultural Mechanization and Agricultural Machinery Industry in Turkey Prof. Cengiz Akdeniz, Chairman of Section IV of CIGR, Ege University Science and Technology Center, Turkey</p>

附件二



Technical Sessions: Oral Presentation

[Room I (302A)] Power and Machinery (PM) 1	
Date: May 23 14:30 - 16:00	
Chairperson: Prof. Chyng Ay, National Chiayi University, Taiwan	
Time No.	Title
14:30 I-1	Current Issues and Prospects for Agricultural Machinery Industry of the Russian Federation Tatyana Sandakova ¹ , Hideo Hasegawa ^{2*} , Daba Radasev ³ , Nadezhda Sandakova ⁴ , Svetlana Sandakova ⁵ ¹ Graduate School of Science and Technology, Niigata University, Japan ² Institute of Science and Technology, Niigata University, Japan ³ Department of Engineering, Buryat State Academy of Agriculture, Russia ⁴ Graduate School of Science and Technology, Niigata University, Japan ⁵ Nature Management Department, Far East State Agrarian University, Russia
14:45 I-2	Bump Shock Reduction of an Agricultural Front-end Loader Using a Hydraulic Circuit of Boom Suspension Bong Jin Cho ¹ , Hak Jin Kim ^{2*} , Chang Joo Lee ³ , Sung Wook Ahn ⁴ , Young Hwan Yoon ⁵ ¹ Department of Biosystems Engineering, Seoul National University, Korea ² Sejin IZB, Atan, Chungnam, Korea ³ J&F Solution Co., Ltd., Seocho gu, Seoul, Korea
15:00 I-3	An Electric Controller for Parallel Positioning of an Agricultural Front-end Loader Chang Joo Lee ¹ , Jong Woo Ha ² , Bong Jin Cho ³ , Hak-Jin Kim ^{4*} ¹ Department of Biosystems Engineering, Seoul National University, Seoul 08826, South Korea ² KSP Co., Ltd. B-San, Jeon-Buk, South Korea
15:15 I-4	Automatic Clutch Control for Automated Manual Transmission of Agricultural Tractor Yong-Joo Kim ¹ , Sun-Oh Chung ² , Dae-Hyun Lee ³ , Chang-Hyun Choi ⁴ , Wan-Soo Kim ^{5*} ¹ Dept. of Biosystems Machinery Engineering, Chungnam National University, Republic of Korea ² Dept. of Agricultural Engineering, National Institute of Agricultural Sciences, Republic of Korea ³ Dept of Bio-mechatronic Engineering, Sungkyunkwan University, Republic of Korea
15:30 I-5	Improvement of Shift Quality in Agricultural Power Shuttle Tractor Controlling Input Rpm Won Sun Hong ¹ , Su Chul Kim ² , In Kyung Shin ³ , Kyeong Uk Kim ^{4*} ¹ Department of Biosystems Engineering, Seoul National University, Seoul Korea ² LSMtron R&D Center, Korea
15:45 I-6	Optimizing the Power Requirement and the Weeding Efficacy for Inter-row Paddy Weeders Joko Pitoyo ^{1*} , Keiichi Shoji ² , Tsumao Kawamura ³ ¹ JSAM Student member, Graduate School of Agricultural Science, Kobe University, Japan ² JSAM Member, Graduate School of Agricultural Science, Kobe University, Japan

7



[Room I (302A)] Power and Machinery (PM) 2	
Date: May 23 16:15 - 17:45	
Chairperson: Prof. Yong-Joo Kim, Chungnam National University, Korea	
Time No.	Title
16:15 I-7	Development of a Novel Planter of Adzuki Bean David Pothen Huang ¹ , Chih-Hang Chang Kaohsiung District Agricultural Research and Extension Station, C.O.A., E.Y., Taiwan
16:30 I-8	Study on the Clipping-up Type Onion Harvester Pao-Chuan Chen ¹ , Chen-Hsiung Hung ² , Chung-Chyi Yu ³ , Jinnm-Ming Chen ⁴ , Feng-Jehng Wang ^{5*} ¹ Dept of Bio-Industrial Mechatronics Engineering, National Chung-Hsing University, Taiwan ² Dept. of Bio-Mechatronics Engineering, Pingtung University of Science and Technology, Taiwan
16:45 I-9	Seeding Performance of a Vacuum Type Precision Metering Unit Depend on Vacuum Plate's Peripheral Speed Erdem Aykas ^{1*} , Ceren Komekci, Fat Komekci Ege University Faculty of Agriculture, Department of Agricultural Engineering and Technology, Turkey
17:00 I-10	Design of a Soil-stratum-setting Type Manure Spreading Machine Yi-Chieh Chia ¹ , Gang-Jhy Wu ² , Chu-Hsiu Chen ³ ¹ Professor, Department of Biomechatronic Engineering, National Ilan University, 1, Sec. 1, Shen-Lung Rd, Yilan 26041, Taiwan ² Associate Professor, Department of Biomechatronic, National Ilan University, 1, Sec. 1, Shen-Lung Rd, Yilan 26041, Taiwan ³ Research Assistant, Department of Biomechatronic Engineering, National Ilan University, 1, Sec. 1, Shen-Lung Rd, Yilan 26041, Taiwan
17:15 I-11	Investigation of Mechanical Threshing Characteristics of Sorghum Momonari J. Simamoto ¹ , Muneishi Mitooka ² , Eiji Inoue ^{3*} , Takashi Okayasu ⁴ , Yumamaru Hirai ⁵ ¹ Department of Agro-Environmental Sciences, Graduate School of Kyushu University ² Department of Biomechatronic Engineering, National Ilan University, Taiwan
17:30 I-12	Development of a Telemetry Remote Control Driving System for Unmanned Rice Combine Harvesters Gang-Jhy Wu ^{1*} , Hsu-Fang Lee Department of Biomechatronic Engineering, National Ilan University, Taiwan

8



[Room I (302A)] Power and Machinery (PM) 3 / Information & Electronics (IE) 1	
Date: May 24 9:15 - 10:30	
Chairperson: Prof. Takashi Okayasu, Kyushu University, Japan	
Time No.	Title
9:15 I-13	Computer Simulation of the Safety for Agricultural Transporters Chung-Kea Yeh ^{1*} , Kai-Chung Huang ² ¹ Associate Professor, Department of Bio-Industrial Mechatronics Engineering, National Taiwan University, Taiwan ² Former Graduate Student, Department of Bio-Industrial Mechatronics Engineering, National Taiwan University, Taiwan
9:30 I-14	Vibration and Noise Measurement and Comparison of a Gasoline-engine-powered Cultivator with an Electric-motor-powered One Chen-Han Tsou ¹ , Gang-Jhy Wu ^{2*} ¹ Department of Biomechatronic Engineering, National Ilan University, Taiwan ² Department of Biomechatronic Engineering, National Ilan University, Taiwan
9:45 I-15	Development of the Vibration Analysis Model of Agricultural Tractor Joo Seon Oh ¹ , Jung Hun Kim ² , Seong Un Park ³ , Kyeong Uk Kim ^{4*} ¹ Department of Biosystems Engineering, Seoul National University, Korea ² TYM R&D Center, Kongsju, Korea
10:00 I-16	Discussion and Improve the Accuracy of Kinect Depth Image Yen-Hao Chang, Tzu-Ting Hung, Yi-Ting Huang, Chun-Yu Tsai, Chyng Ay ^{1*} Dept. of Biomechatronic Engineering, National Chiayi University, Taiwan
10:15 I-17	A Study of Measurement Accuracy for 3D Space by Dual-Lens Chun-Yu Wu, Chun-Yu Tsai, Chyng Ay ^{1*} Department of Biomechatronic Engineering, National Chiayi University, Taiwan

9



[Room II (302B)] Postharvest Technology (PT) 1	
Date: May 23 14:30 - 16:00	
Chairperson: Dr. Yukiharu Ogawa, Chiba University, Japan	
Time No.	Title
14:30 II-1	Developing of a Peeling Device for Irregular Shape of Farm Products: a Case Study of the Stems of Pineapple Jhao-Ming Pan ¹ , Chih-Han Lin ² , Li-Cheng Hsieh ^{3*} ¹ Former Graduate Student, ² College Student, ³ Associate Professor, Department of Bio-Industrial Mechatronics Engineering, National Chung Hsing University, Taiwan
14:45 II-2	Semi-automatic Machine for Removing Lotus Seed Plumules Wen-Luh Huang ¹ , Hong-Ru Huang ² , Chun-Chen Hsieh ^{3*} , Shu-Yu Yang ⁴ , Chung-Teh Shang ⁵ ¹ Department of Biomechatronic, National Chiayi University, Taiwan ² Department of Biomechatronic, National Chiayi University, Taiwan ³ Department of Bio-Industrial Mechatronics Engineering, National Chung Hsing University, Taiwan
15:00 II-3	Uncomplicated Type Lotus Seeds Thresher Wen-Luh Huang ¹ , Shu-Yu Yang ^{2*} , Chun-Chen Hsieh ³ ¹ Department of Biomechatronic, National Chiayi University, Taiwan ² Department of Biomechatronic, National Chiayi University, Taiwan
15:15 II-4	Contribution of Aquaporins to Membrane Water Permeability of Harvested Spinach Leaves Mai Tamaki ¹ , Shinichiro Karaki ² , Yuchi Uno ³ , Hiromichi Itoh ⁴ , Kobai Nakano ⁵ ¹ Graduate School of Agricultural Science, Kobe University, Japan ² United Graduate School of Agricultural Science, Gifu University, Japan
15:30 II-5	Postharvest Technology of Sago Pith (Metroxylon Sp.) Effect on Quality of Sago Starch (Case study in West Java, Indonesia) Kun Tami Dewandari and Hurd Setyanran Indonesian Center for Agricultural Postharvest Research and Development (ICAPRD), Indonesia
15:45 II-6	The Effect of In-Package Atmosphere on Sulfurophane Content in Broccoli Sunnaq Botigim, Yoshio Makino, Seitschi Ohtsu, Takashi Akihiro, Masami Hirai, Ayuko Kawahara The University of Tokyo Shimane University Riken center for sustainable resource science

13

附件三



[Room II (302B)] Postharvest Technology (PT) 3 / Food Engineering (FE) 1	
Date: May 24 9:15 - 10:30	
Chairperson: Dr. Takuma Genkawa, University of Tsukuba, Japan	
Time No.	Title
9:15 II-13	The Effect of Storage Environment on the Respiratory Enzyme Activity in Broccoli Hsiao-Wen Wang ¹ , Yoshio Makino ^{2*} , Seichi Oshita ¹ , Kensaku Masjima ¹ , Sachiko (Noguchi) Fumayama ¹ , Kou Noguchi ¹ ¹ Graduate School of Agricultural and Life Sciences, The University of Tokyo, Japan ² School of Science, The University of Tokyo, Japan ³ School of Life Sciences, Tokyo University of Pharmacy and Life Sciences, Japan
9:30 II-14	The Design and Analysis of Pre-dryer for High Moisture Content Paddy Yan-Hong Lin, Yuen-Chung Lee ^{2*} , Wei-Hong Hsu Dept. of Bio-industrial Mechatronics Engineering, National Taiwan University, Taiwan
9:45 II-15	Relationship Between Rice Kernel Maturity and Physicochemical Properties Edenio Olivares Diaz, Shuzo Kawamura ^{2*} , Atsushi Jo, Shigenobu Kosaki Laboratory of Agricultural and Food Process Engineering, Graduate School of Agricultural Science, Hokkaido University, Japan
10:00 II-16	Review Study on Afghanistan Dairy Processing Rasool Khan Amin ¹ , Mito Kokawa ¹ , Yutaka Kitamura ² ¹ Graduate School of Life and Environmental Sciences, University of Tsukuba, Japan ² Faculty of Life and Environmental Sciences, University of Tsukuba, Japan
10:15 II-17	Nondestructive Measurement for Vitamin E Concentration in Intact Shell Egg Using Visible and Near Infrared Spectroscopy Shinichiro Kuroki ^{1*} , Takahisa Kanoo, Hiromichi Itoh, Hiroshi Kamisoyama Graduate School of Agricultural Science, Kobe University, Japan



[Room II (302B)] Food Engineering (FE) 2	
Date: May 24 10:45 - 12:00	
Chairperson: Prof. Suming Chen, National Taiwan University, Taiwan	
Time No.	Title
10:45 II-18	The Effect of Pulverization on Phosphatidic Acid in Cabbage Misaki Nakamura ¹ , Mito Kokawa ¹ , Yutaka Kitamura ² ¹ Graduate School of Life and Environmental Sciences, University of Tsukuba, Japan ² Faculty of Life and Environmental Sciences, University of Tsukuba, Japan
11:00 II-19	Optimized Condition Studies of Camellia Oil Cold Pressing Process Syue-Feng Chen ¹ , Hsiang-Chang Huang ¹ , Shan-Fa Kao ¹ , Jan-Jiang Huang ¹ , She-ching Wu ¹ , Hsiang-Yueh Hsiang ^{2*} ¹ Department of Biomechatronic Engineering, National Chiayi University, Taiwan ² Department of Food Science, National Chiayi University, Taiwan
11:15 II-20	Automatic Control of Soy Mash Fermentation for Performance Promotion Using Green Energy with Energy Conservation Shu-Hui Feng ¹ , Chen-Ping Wu ¹ , Yung-Tsong Lu ¹ , Wei-Hua Huang ¹ , Tzu-Chun Lin ¹ , Cheng-Keng Hsu ¹ , Jun-Song Ju ¹ and Chang-Hua Tang ^{2*} ¹ Department of Food Science, National Chiayi University, Taiwan ² Department of Mechanical and Energy Engineering, National Chiayi University, Taiwan ³ Department of Biomechatronic Engineering, National Chiayi University, Taiwan
11:30 II-21	Saccharification Reaction in Baking of Sweet Potato at Constant Temperatures Po-Hsun Wu, Hao-Yuan Chou, Yuen-Chung Lee ^{2*} Department of Bio-industrial Mechatronics Engineering, National Taiwan University, Taiwan
11:45 II-22	Effects of Hot Water Blanching on Biological and Physicochemical Properties of Sweet Potato Slice Chhe Chinda ¹ , Teppei Imaizumi ¹ , Fumihiko Tanaka ¹ and Toshitaka Uchino ² ¹ Graduate School of Bioscience and Bioenvironmental Sciences, Kyushu University, Japan ² Faculty of Agriculture, Kyushu University, Japan



[Room II (302B)] Food Engineering (FE) 3 / Food Safety (FS) 1	
Date: May 24 14:30 - 16:00	
Chairperson: Prof. Yuen Chung Lee, National Taiwan University, Taiwan	
Time No.	Title
14:30 II-23	Mathematical Model and Simulation of Wheat Germ Drying Experiments in Fluidized Bed Jun-Sheng Chan ¹ , Der-Sheng Chan ^{2*} , Meng-I Kuo ³ , Hsui-Wen Yang ¹ ¹ Department of Food Science, Fu Jen Catholic University, Taiwan ² Department of Information Technology, Lee Ming Institute of Technology, Taiwan ³ Department of Food Science, National Chiayi University, Taiwan
14:45 II-24	Effect of Cow Individuality on Accuracy of Calibration Models Using Near-infrared Spectroscopy for Determining Milk Constituents During Milking Patricia Iwaka ¹ , Shuzo Kawamura ^{2*} , Akane Morita ¹ , Tomohiro Mitani ¹ , Tohyuki Okatani ¹ , Shigenobu Kosaki ¹ ¹ Laboratory of Agricultural and Food Process Engineering, Graduate School of Agriculture, Hokkaido University, Japan ² Field Science Center for Northern Biosphere, Hokkaido University, Japan ³ Onon Machinery Co. Ltd., Japan
15:00 II-25	Mathematical Modeling of Bacterial Penetration into Meat Hiroski Shirai ¹ , Ashim K. Datta ^{2*} , Seichi Oshita ^{1*} , Yoshio Makino ¹ ¹ Department of Biological and Environmental Engineering, Graduate School of Agricultural and Life Sciences, The University of Tokyo, Japan ² Department of Biological and Environmental Engineering, Cornell University, USA
15:15 II-26	Numerical Modeling of Peroxidase Inactivation of Potato Tuber Teppei Imaizumi ^{1*} , Fumihiko Tanaka ¹ , Toshitaka Uchino ² ¹ JSPS Research Fellow, Kyushu University, Japan ² Graduate School of Agriculture, Kyushu University, Japan
15:30 II-27	Evaluation of Caffeine Content in Baking Paochong Tea Using Near Infrared Spectroscopy Cheng-Hou Chang ¹ , Shao-Mei Lin ¹ , Chia-Chang Wu ¹ , Chao-Yin Tsai ¹ , Suming Chen ^{2*} ¹ Dept. of Bio-industrial Mechatronics Engineering, National Taiwan University, Taiwan ² Tea Research and Extension Station, Taoyuan, Taiwan
15:45 II-28	Prediction of Color Change of Maillard Reaction for Development of a Flexible Time Temperature Indicator Junghyun Lee, Rikako Harada, Shuzo Kawamura, Shigenobu Kosaki Graduate School of Agricultural Science, Hokkaido University, JAPAN



[Room II (302B)] Postharvest Technology (PT) 3 / Food Engineering (FE) 1	
Date: May 24 9:15 - 10:30	
Chairperson: Dr. Takuma Genkawa, University of Tsukuba, Japan	
Time No.	Title
9:15 II-13	The Effect of Storage Environment on the Respiratory Enzyme Activity in Broccoli Hsiao-Wen Wang ¹ , Yoshio Makino ^{2*} , Seichi Oshita ¹ , Kensaku Masjima ¹ , Sachiko (Noguchi) Fumayama ¹ , Kou Noguchi ¹ ¹ Graduate School of Agricultural and Life Sciences, The University of Tokyo, Japan ² School of Science, The University of Tokyo, Japan ³ School of Life Sciences, Tokyo University of Pharmacy and Life Sciences, Japan
9:30 II-14	The Design and Analysis of Pre-dryer for High Moisture Content Paddy Yan-Hong Lin, Yuen-Chung Lee ^{2*} , Wei-Hong Hsu Dept. of Bio-industrial Mechatronics Engineering, National Taiwan University, Taiwan
9:45 II-15	Relationship Between Rice Kernel Maturity and Physicochemical Properties Edenio Olivares Diaz, Shuzo Kawamura ^{2*} , Atsushi Jo, Shigenobu Kosaki Laboratory of Agricultural and Food Process Engineering, Graduate School of Agricultural Science, Hokkaido University, Japan
10:00 II-16	Review Study on Afghanistan Dairy Processing Rasool Khan Amin ¹ , Mito Kokawa ¹ , Yutaka Kitamura ² ¹ Graduate School of Life and Environmental Sciences, University of Tsukuba, Japan ² Faculty of Life and Environmental Sciences, University of Tsukuba, Japan
10:15 II-17	Nondestructive Measurement for Vitamin E Concentration in Intact Shell Egg Using Visible and Near Infrared Spectroscopy Shinichiro Kuroki ^{1*} , Takahisa Kanoo, Hiromichi Itoh, Hiroshi Kamisoyama Graduate School of Agricultural Science, Kobe University, Japan

附件四

[3F Foyer] Core time: May 23 13:15 - 14:15, May 24 13:15 - 14:15	
No.	Title
Biological Engineering (BE)	
P-01	Investigate Biological and Mechanical Alteration of 7F2 Mouse Osteoblast: Between Osteogenic and Adipogenic Differentiation Chih-Chang Yeh ¹ , Chia-Wen Chang ² , and Hsin-I Chang ^{3*} ¹ Orthopedic Department, Chiayi Branch, Taichung Veterans General Hospital, Taiwan ² Department of Biochemical Science and Technology, National Chia Yi University, Taiwan
P-02	Behavioral Ecotoxicology Modeling of Freshwater Clam Valve Rhythm in Response to Waterborne Copper Li-John Jou ¹ , Wei-En Mai ^{1*} ¹ Department of Biomechatronic Engineering, National Ilan University, Taiwan
P-03	Lactate-based Biopolymer Production by Recombinant <i>Escherichia Coli</i> in a 2L Jar Fermenter Kenji Takisawa ^{1,2} , Tohiko Ooi ^{1,3} , Kenichiro Matsumoto ¹ , Seiichi Taguchi ^{1,2*} ¹ Graduate School of Engineering, Hokkaido University, Japan ² CREST, Japan Science and Technology Agency, Japan
P-04	On Phase Diagram by Using Self-developed TEC Difference Scanning Calorimeter Chih-Chieh Lo, Chang-Yi Yang ¹ , Department of Biomechanical Engineering, National Ilan University, Taiwan
P-05	Development of Seeder for Mixed Planting of Soybean and Corn Seung Min Woo, Uyeih Daniel Doovm, Moon Sang Sagong, Yu Shin Ha [*] Kyungpook National University, Korea
P-06	Decision Support System for Blade Selection in Garden Tillers Yi-Chieh Chiu ¹ , Pei-Wen Huang ² ¹ Professor, National Ilan University, Taiwan ² Graduate student, National Ilan University, Taiwan
P-07	A New Identification and Locating System of Shrimp Head Yi-Chieh Chiu ¹ , Zi-Yin Liu ^{1*} ¹ Professor, National Ilan University, Taiwan ² Graduate student, National Ilan University, Taiwan
P-08	The Development of a Chip-based Platform Integrated with Dielectrophoresis for Cell Pairing and Electrofusion Min-Sheng Hung ¹ , Yi-Ming Zhao Department of Biomechanical Engineering, National Chiayi University, Taiwan
P-09	Automatic Leaf Motion Analysis: Using Optical Flow to Diagnose Plant Behavior in Response to Environmental Changes Andri Prima Nugroho ¹ , Takashi Okayama ^{2*} , Atrushige Sakai ¹ , Eiji Inoue ¹ , Yasumaru Hirai ¹ , Munehisa Minotoki ¹ , Liliq Sutiarso ³ ¹ Graduate School of Bioscience and Bioenvironmental Sciences, Kyushu University, Japan ² Department of Agro-environmental Sciences, Faculty of Agriculture, Kyushu University, Japan ³ Department of Agricultural Engineering, Faculty of Agricultural Technology, Universitas Gadjah Mada, Indonesia

30

[Room 201] Core time: May 23 13:15 - 14:15, May 24 13:15 - 14:15	
No.	Title
Biological Engineering (BE)	
P-38	Long-term Antihypertensive Effects of Far Infrared Rays Irradiated from Wooden Board in Spontaneously Hypertensive Rats Tsong-Shyan Chin ¹ , Hsin-I Chang ¹ , Tseng-Chieh Tsai ¹ , Cheng-Nan Chen ^{1*} ¹ Department of Aquatic Biosciences, National Chiayi University, Taiwan ² Department of Biochemical Science and Technology, National Chiayi University, Taiwan ³ Department Microbiology, Immunology and Biopharmaceuticals, National Chiayi University, Taiwan
P-39	Upregulation of Bone Morphogenetic Protein-2 Synthesis and Consequent Collagen II Expression in Leptin-stimulated Human Chondrocytes Shih-Rong Kuo ¹ , Hsin-I Chang ¹ , Tseng-Chieh Tsai ¹ , Cheng-Nan Chen ^{1*} ¹ Department of Aquatic Biosciences, National Chiayi University, Taiwan ² Department of Biochemical Science and Technology, National Chiayi University, Taiwan ³ Department Microbiology, Immunology and Biopharmaceuticals, National Chiayi University, Taiwan
P-40	Effect of Cross Transfer Effects Conferred by Low Intensity Eccentric Exercise on Electromyographic Activity Hsin-Lian Chen, Ming-Ju Lin [*] , Jian-Han Lai Department of Physical Education, Health & Recreation, National Chiayi University, Taiwan
P-41	Lettuce Appearance Measurement Using Image Processing Yung-Chuan Chou ¹ , Ben-Ru Huang ¹ , Chyng-Ay ¹ , Yen-Jen Huang ^{1*} , Wei-Ru Kuo ² , Jeng-Liang Lin ¹ ¹ Department of Biomechanical Engineering, National Chiayi University, Taiwan ² Department of Horticulture, National Chiayi University, Taiwan
P-42	Study of the Fluid Shear Stress on Inflammatory Rat Aorta Abdominalis Kuan-Fu Liu, Hao-Huan Hsu, Cheng-Wen Chen, Chyng-Ay [*] Dept. of Biomechanical Engineering, National Chiayi University, Taiwan
P-43	Stress Analyses of Fruit Stacks Young-Chuan Chen ¹ , Hsun-Hsing Tsai ^{1*} , ¹ Dept. of Vehicle Engineering, National Pingtung University of Science and Technology, Taiwan ² Dept. of Biomechanical Engineering, National Pingtung University of Science and Technology, Taiwan
P-44	Development of Automated System to Pick Seedlings Up for Vegetable Transplanters T.G.Kang ^{1*} , S.W.Kim ¹ , Y.K.Kim ¹ , S.H.Lee ¹ , H.J.Jun ¹ , I.S.Choi ¹ , H.G.Kim ¹ , O.Y.Yang ¹ , K.S.Jang ¹ ¹ Department of Agricultural Engineering in National Academy of Agricultural Science (NAAS), Korea ² National Institute of Horticultural and Herbal Science, Korea ³ Gyeongsangbuk-do Agricultural Research & Extension Services, Korea
P-45	Investigation of Brain Situation Attention Using Brainwave Mind Games Zhao-Wei Chen, Ming-Ling Cheng, Ya-Ting Chang, Chun-Yu Tsai, Chyng-Ay [*] Dept. of Biomechanical Engineering, National Chiayi University, Taiwan
P-46	The Effects on Spectral Characteristics of Brainwave Under Stimulation of Binaural Beats Music Hsieh-Ming Chiang, Pei-Huan Tseng, Liang-Huang Kuo, Chun-Yu Tsai, Chyng-Ay [*] Dept. of Biomechanical Engineering, National Chiayi University, Taiwan

35

二、與會見聞或新知

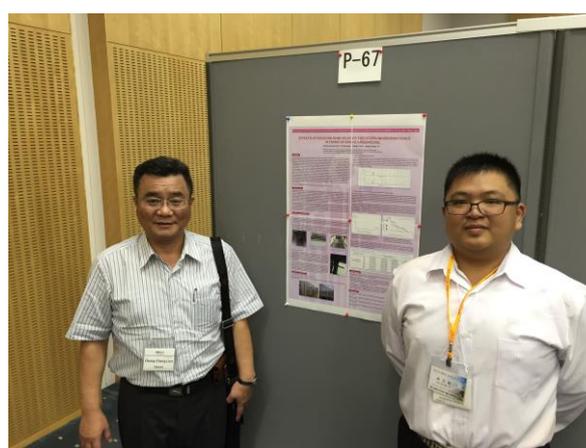
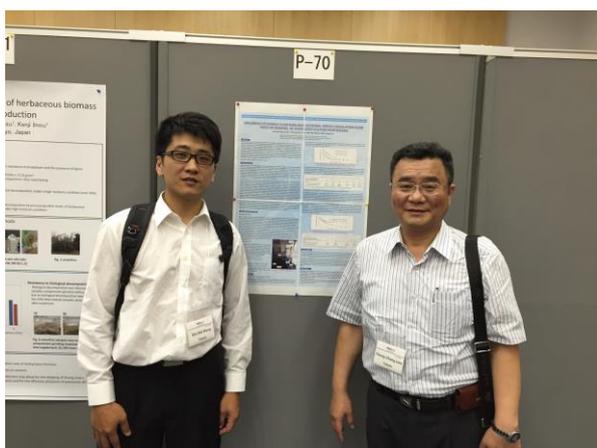
2016 年農業與生物生產系統機電整合國際學術會議（International Symposium on Machinery and Mechatronics for Agricultural and Biosystems Engineering, 2016ISMAB），提高機械工程與自動化工程相關的技術研究人員和從業人員之間的溝通。本次參與此國際會會議期能瞭解目前國際在細胞力學方面的各種應用，以期未來能夠進一步做相關方面的研究。口頭發表及壁報發表的過程順利，充分強調研究的重點，會後也和與會人士討論相關的研究主題及成果，收穫豐富。

會後攜回參加會議論文發表證明及相關資料如下：

(一) 研討會場報到及參加相片



研討會報到及參加大會開幕



壁報論文發表

(二) ISMAB2016 會議程序手冊及論文摘要集



參、心得與建議事項

一、心得

能夠有機會參與 2016 年農業與生物生產系統機電整合國際學術會議 (2016ISMAB)，並與生物機電研究的相關領域跟各地專家相互討論交流與分享研究成果，感覺獲益良多。在相關議題相互討論及分享研究成果與實務經驗，進而強化國內相關學術研究領域應用視野，對與會的國內學者有顯著助益。

與來自各地的專家學者齊聚一堂，針對生物機電研究的相關議題相互討論、彼此交流、分享研究成果與實務經驗，實在是獲益良多。會議期間與數位大陸優秀學者進行學術交流，瞭解到現今中國學術研究已漸漸蓬勃發展，深深地覺得臺灣要繼續保持學術優勢需不斷的提升自我的學術能力，多與全球進行學術交流，擬定學術研究正確的方向，避免閉門造車之憾。

二、建議事項

參加這次會議，有些感觸與建議，這裡提出幾點建議意見：

- (一) 由此次的參與過程可知，在舉辦國際研討會可交由專門公司承包，可減輕承辦人員的負擔。反觀我國所有大小事情全需要承辦單位包辦，但事事受限於會計法，承辦人員會很累。
- (二) 由大會中發表的論文可看出，除了生物醫學工程和機電控制研究領域之外，各國專家學者都積極的從事於新興科技的研究，如微奈米科技、生醫工程和感測技術的開發。此在生物機電未來的研究上，運用新興科技是生物機電工程人員必須著墨的範疇。