

# IECON'01

## **The 27th Annual Conference Of The IEEE Industrial Electronics Society**

**Hyatt Regency Tech Center, Denver, Colorado, USA**

**Nov 29 (Thu) to Dec 2 (Sun) 2001**

Sponsored by IEEE Industrial Electronics Society

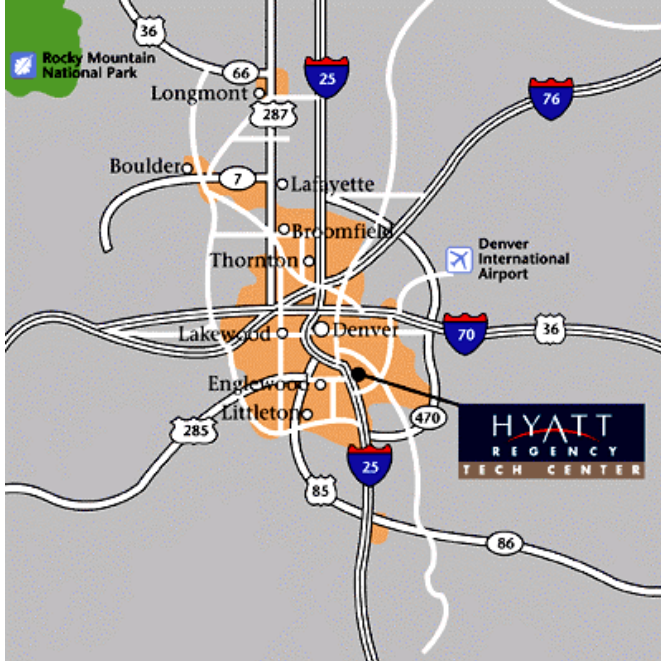
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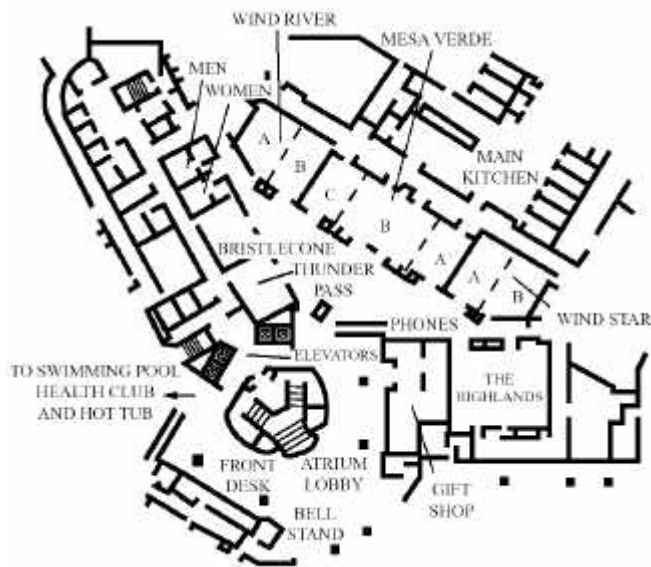
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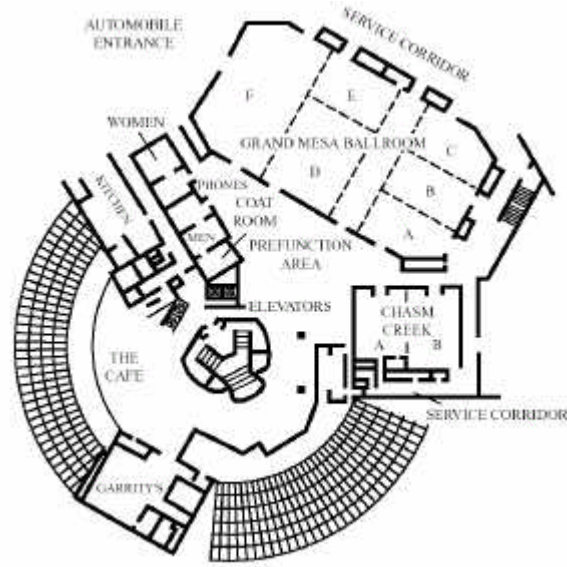
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## **Special Session on PM Motor Control**

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## **Special Session on Real Time Simulation of Transportation Systems**

**Brian Johnson**, b.k.johnson@ieee.org  
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**Michael Kyte**, mkyte@uidaho.edu  
University of Idaho, USA,

## **Special Sessions on Renewable Energy Systems**

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## **Special Session on Soft Computing Based Image Processing**

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## **Special Sessions on Software Engineering,**

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**Andreas Speck**, speck@informatik.uni-tuebingen.de  
University of Tuebingen, Germany

## **Special Session on Survivable Systems and Networks,**

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## **Special Session on Application of Knowledge-Based Systems in Power and Control**

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# Conference Program

## CI01: Intelligent Soft Computing

Wind River A Room, Saturday, Dec 1, 3:00PM to 4:50PM

Session Co-Chairs: A. Chohra and F. Janabi-Sharifi, Ryerson University, Canada

<b>Cutting Torque Estimation using Probabilistic Incremental Program Evolution Algorithm</b> .....	1
Shigeyasu Kawaji <sup>1</sup> , Masaki Arao <sup>2</sup> , and Yuehui Chen <sup>1</sup>	
<sup>1</sup> Kumamoto University, <sup>2</sup> OMRON Corporation	
<b>Total Systems Cost Minimization in CDMA PCS Network Using Hierarchical Genetic Algorithms</b> .....	7
T. M. Chan, Sam Kwong, K F. Man, and K. S. Tang	
City University of Hong Kong	
<b>Radial Basis Function Neural Networks in Variable Structure Control of a Class of Biochemical Processes</b> .....	13
Mehmet Onder Efe <sup>1</sup> , Okyay Kaynak <sup>2</sup> , Bogdan M. Wilamowski <sup>3</sup> , and Xinghuo Yu <sup>4</sup>	
<sup>1</sup> Carnegie Mellon University, <sup>2</sup> Bogazici University, <sup>3</sup> University of Idaho	
<sup>4</sup> Central Queensland University	
<b>Evolutionary Optimization of a Universal Motor</b> .....	19
Gregor Papa <sup>1</sup> , Barbara Koroušič-Seljak <sup>1</sup> , Boris Benedicic <sup>2</sup> , and Tomaž Kmecl <sup>2</sup>	
<sup>1</sup> Jožef Stefan Institute, <sup>2</sup> Strategic R&D Dept.	
<b>Tuning of the Structure and Parameters of Neural Network using an Improved Genetic Algorithm</b> .....	25
H. K. Lam, S. H. Ling, F. H. F. Leung, and P. K. S. Tam	
The Hong Kong Polytechnic University	

## CI02: Fuzzy Systems

Wind River A Room, Sunday, Dec 2, 8:00AM to 9:50AM

Session Co-Chairs: F. Janabi-Sharifi<sup>1</sup> and Gregor Papa<sup>2</sup>, <sup>1</sup>Ryerson University, Canada <sup>2</sup>Jožef Stefan Institute, Slovenia

<b>Cost Effective Computationally Intelligent Control – An Augmented Switching Manifold Approach</b> .....	31
Mehmet Onder Efe <sup>1</sup> , Okyay Kaynak <sup>2</sup> , Xinghuo Yu <sup>3</sup> , and Serdar Iplikci <sup>2</sup>	
<sup>1</sup> Carnegie Mellon University, <sup>2</sup> Bogazici University, <sup>3</sup> Central Queensland University	
<b>A Fuzzy Logic and Variable Structure Based Controller for pH Control</b> .....	37
Luis Zárate <sup>1</sup> , Peterson Resende <sup>2</sup> , and Benjamin Menézes <sup>2</sup>	
<sup>1</sup> Pontifical Catholic University of Minas Gerais, <sup>2</sup> Federal University of Minas Gerais	
<b>Decision Maker for Robot Soccer</b> .....	43
H. K. Lam, T. H. Lee, F. H. F. Leung and P. K. S. Tam	
The Hong Kong Polytechnic University	
<b>Predictive Maintenance Oriented Neural Network System – PREMON</b> .....	49
Javier Roper Peláez <sup>1</sup> , Mariana A Aguiar <sup>1</sup> , Ricardo C. Destro <sup>1</sup> , Zsolt L. Kovács <sup>1</sup> , and Marcelo G Simoes <sup>2</sup>	
<sup>1</sup> University of Sao Paulo, <sup>2</sup> Colorado School of Mines	

## CI03: Neuro-Fuzzy Systems

Wind River B Room, Sunday, Dec 2, 1:00PM to 2:50PM

Session Co-Chairs: H.K. Lam<sup>1</sup> and M. Farooq<sup>2</sup>, <sup>1</sup>The Hong Kong Polytechnic University, Hong Kong <sup>2</sup>Royal Military College of Canada, Canada

<b>A Novel Hybrid Stepping Motor Fuzzy-Neural Position Servo System</b> .....	53
Shi Jingzhuo, Xu Dianguo, and Wang Zongpei	
Harbin Institute of Technology	

<b>Neuro-Fuzzy loop Control with T-operator and Rule-tuning for Rolling Mills: Theory and Comparative Study</b> .....	58
F. Janabi Sharifi Ryerson University	
<b>Neural Networks And Fuzzy Rules Based Control For Cold Rolling Process</b> .....	64
Luis Zárata and Fabrício Bitencout Pontifical Catholic University of Minas Gerais	
<b>Neurofuzzy Controller in Automatized Climatization for Poultry Houses</b> .....	70
Adriano Sanick Padilha <sup>1</sup> , Felix Alberto Farre <sup>1</sup> , and Vladimir Popov <sup>2</sup> <sup>1</sup> Universidade Federal de Santa Maria <sup>2</sup> Kiev Polytechnic Institute	

**ET01: New technologies Power Electronics 1**

Wind River B Room, Thursday, Nov 29, 1:00PM to 2:50PM  
 Session Co-Chairs: Leopoldo G. Franquelo<sup>1</sup> and Antonio Torralba<sup>2</sup>,  
<sup>1</sup>Escuela Superior de Ingenieros, <sup>2</sup>Universidad de Sevilla, Spain

<b>Design and Evaluation of High Security Contact/Contactless Smart IC Cards</b> .....	76
Koji Tsuru, Koushi Murata, Yoshimitsu Ohtani, and Yasuhiro Nagai NTT Cyber Space Laboratories, NTT Corporation	
<b>A Proposal of Collision Avoidance Algorithm for Driving Support System</b> .....	80
Tatsuya Nishi and Tomohiro Takagi Meiji University	
<b>Towards the Fault Tolerant Software: Fuzzy Extension of Crisp Equivalence Voters</b> .....	84
Milos Manic and Deborah Frincke University of Idaho	
<b>Tools for Rapid Prototyping of Embedded Control Systems</b> .....	90
Winfred Anakwa, Eugene Cohen, Apruva Naik, Doug Carlton, Darrell Glen, and Jose Lopez Bradley University	
<b>Broken Bar Detection In Induction Motor Via Wavelet Transformation</b> .....	95
Karim Abbaszadeh <sup>1</sup> , Jafar Milimonfared <sup>1</sup> , Masoud Haji <sup>2</sup> , and Hamid Toliyat <sup>2</sup> <sup>1</sup> Amir-Kabir University of Technology, <sup>2</sup> Texas A&M University	

**ET02: New Technologies Power Electronics 2**

Wind River B Room, Friday, Nov 30, 8:00AM to 9:50AM  
 Session Co-Chairs: Teresa Riesgo<sup>1</sup> and Juan Manuel Carrasco<sup>2</sup>,  
<sup>1</sup>Universidad Politecnica de Madrid, Spain <sup>2</sup>Universidad de Sevilla, Spain

<b>A Method for Synchronizing Low Cost Energy Aware Sensors used in Industrial Process Monitoring</b> .....	100
Mikael Nordman <sup>1</sup> , Wojciech Kozlowski <sup>2</sup> , and Olavi Vähämäki <sup>3</sup> <sup>1</sup> Helsinki University of Technology, <sup>2</sup> Info Tech, <sup>3</sup> ABB Corporate Research Oy	
<b>A Digital Rotor Flux Observer for Robust Vector Control of the Induction Machine</b> .....	107
Celso P Bottura and Sergio A Augusto Filho Dmcsi-Feeec Unicamp	
<b>EMI Emissions up to 1 GHz from Adjustable Speed Drives</b> .....	113
Matthew Wisniewski <sup>1</sup> , Robert Kubicek <sup>2</sup> , and John Pierre <sup>2</sup> <sup>1</sup> Lockheed-Martin, <sup>2</sup> University of Wyoming	
<b>Modular PM Motor Drives for Automotive Traction Applications</b> .....	119
Gui-Jia Su <sup>1</sup> , John McKeever <sup>1</sup> , and Kelly Samons <sup>2</sup> <sup>1</sup> Oak Ridge National Laboratory, <sup>2</sup> Visual Computing Systems	

### ET03: Sensors and Devices

Wind River B Room, Friday, Nov 30, 4:00PM to 5:50PM

Session Co-Chairs: Leopoldo Franquelo<sup>1</sup> and Winfred Anakwa<sup>2</sup>, <sup>1</sup>Universidad de Sevilla, Spain <sup>2</sup>Bradley University, USA

<b>A Dual-Band and Wide-Band Antenna on Flexible Substrate for Smart Clothing .....</b>	<b>125</b>
Pekka Salonen and Jaana Rantanen Tampere University of Technology	
<b>Estimation of State of Charge of Lead Acid Battery Using Radial Basis Function .....</b>	<b>131</b>
Sauradip Malkhandi, S. K. Sinha, and K. Muthukumar Indian Institute of Science	
<b>Properties of Gallium Oxide Thin Film Sputtered from Powder Target for High Temperature Oxygen Sensor .....</b>	<b>137</b>
Masami Ogita, Katsuhiko Kobayashi, Yasushi Yamada, Yoichiro Nakanishi, and Yoshinori Hatanaka Shizuoka University	
<b>Enhancing The Sensitivity of Miniaturized Quadrupole Mass Spectrometers.....</b>	<b>147</b>
Bogdan Wilamowski <sup>1</sup> , David Bell <sup>2</sup> , Stanislaw Legowski <sup>2</sup> , and Yaser Abdelkader <sup>1</sup> <sup>1</sup> University of Idaho, <sup>2</sup> University of Wyoming	
<b>An Analysis of the Dynamic Performance of Proton Exchange Membrane Fuel Cells Using an Electrochemical Model.....</b>	<b>141</b>
Jeferson Corrêa, Felix A. Farret, and Luciane N. Canha Federal University of Santa Maria	

### ET04: Internet Technologies

Wind River B Room, Saturday, Dec 1, 3:00PM to 4:50PM

Session Co-Chairs: Winfred Anakwa<sup>1</sup> and Teresa Riesgo<sup>2</sup>,

<sup>1</sup>Bradley University, USA <sup>2</sup> Universidad Politecnica de Madrid, Spain

<b>A Scheme to Determine QoS Requirements for Control Network Data over IP .....</b>	<b>153</b>
Stefan Soucek <sup>1</sup> , Thilo Sauter <sup>2</sup> , and Thomas Rauscher <sup>3</sup> <sup>1</sup> Coactive Networks, Inc., <sup>2</sup> Institute of Computer Technology, TU Vienna <sup>3</sup> LOYTEC Electronics GmbH	
<b>An Internet-Based Remote Control and Monitoring Rapid Prototyping System.....</b>	<b>159</b>
Ren C. Luo, Jyh Hwa Tzou, and Yi C. Chang National Chung Cheng University	
<b>Transmission Modeling and Simulation for Internet-Based Control.....</b>	<b>165</b>
Jin-Woo Park and Jang-Myung Lee Pusan National University	
<b>Real Time Control of a Robotic Manipulator via Unreliable Internet Connection .....</b>	<b>170</b>
Aleksander Malinowski, Tim Booth, Sean Grady, and Brian Huggins Bradley University	
<b>Seamless Integration of Distributed Real Time Monitoring and Control Applications Utilising Emerging Technologies .....</b>	<b>176</b>
Vassilis Kapsalis, Athanasios Kalogeras, Kostas Charatsis, and George Papadopoulos University of Patras	

## FA01: Control Applications

Wind River B Room, Thursday, Nov 29, 3:00PM to 4:50PM

Session Co-Chairs: Juan Pimentel<sup>1</sup> and Laszlo Horvath<sup>2</sup>, <sup>1</sup>Kettering University, USA <sup>2</sup>Budapest Polytechnic, Hungary

<b>Development of a Simulation Tool for Pumping Systems with Separate Simulators for Piping and Control Subsystems</b> .....	182
Shinichirou Ie <sup>1</sup> , Hiroshi Itou <sup>1</sup> , Ryuichiro Iwano <sup>1</sup> , Hiroki Itou <sup>2</sup> , and Shirou Matsui <sup>2</sup>	
<sup>1</sup> Power & Industrial Systems R&D Laboratory, Hitachi Ltd. <sup>2</sup> Tsuchiura Works, Hitachi Ltd.	
<b>Distributed System for On-line Quality Control and Production Process Assessment for the Automobile Industry</b> .....	188
Carlos Fernandez, Juan Angel Pastor, Barbara Alvarez, Juan Suardiaz, Andres Iborra, and Jose Maria Fernandez-MeroÑO	
Universidad Politecnica de Cartagena	
<b>Research and Development of Control System in Digital Valve Electric Actuator</b> .....	193
Bing Deng and JunMin Pan	
Shanghai Jiao Tong University	
<b>Intelligent Control of Hydraulic Duplex Pulsating Pump</b> .....	199
Attila L.Bencsik	
Budapest Polytechnic	
<b>Precise, Jerk-free Contouring of Industrial Robot Arms with Trajectory Allowance Under Torque and Velocity Constraints</b> .....	204
Sudath Munasinghe <sup>1</sup> , Nakamura Masatoshi <sup>1</sup> , Takuya Iwanaga <sup>1</sup> , Goto Satoru <sup>1</sup> , and Kyura Nobuhiro <sup>2</sup>	
<sup>1</sup> Saga University, <sup>2</sup> Kinki University (Kyushu)	

## FA02: Factory Automation I

Wind River B Room, Thursday, Nov 29, 5:00PM to 6:50PM

Session Co-Chairs: Francis Long<sup>1</sup> and Imre J. Rudas<sup>2</sup>, <sup>1</sup>University of Colorado at Denver, USA <sup>2</sup>Budapest Polytechnic, Hungary

<b>High Precision Marking-cutting of Shipbuilding Profiled Bars Robot Flexible Manufacturing System</b> .....	210
Zhi Wu Wang, Guo Qing Ding, Liang Ming Lin, and Guo Zhen Yan	
Shanghai Jiaotong University	
<b>The Development of a 12-inch Wafer Prealigner with Optical Character Recognition</b> .....	215
Hee Sub Lee <sup>1</sup> , Jae Wook Jeon <sup>1</sup> , Joon-Woo Kim <sup>2</sup> , Sung-Jong Chung <sup>2</sup> , and Jong-Eun Byun <sup>2</sup>	
<sup>1</sup> Sungkyunkwan University, <sup>2</sup> NextEye Co. Ltd.	
<b>Formal Application of Dummy Parameters in a Soft Computing-Based Control of Mechanical Devices</b> .....	220
József K. Tar <sup>1</sup> , Imre J. Rudas <sup>1</sup> , János F. Bitó <sup>1</sup> , and Karel Jezernik <sup>2</sup>	
<sup>1</sup> Budapest Polytechnic, <sup>2</sup> University of Maribor	
<b>Qualitative Representation of Continuous Time System Toward Discrete Event System Application</b> .....	226
Yoshiaki Itoh	
Kanagawa Industrial Technology Research Institute	

## FA03: Factory Automation II

Wind River B Room, Saturday, Dec 1, 8:00AM to 9:50AM

Session Co-Chairs: Paul Drews<sup>1</sup> and Kazuhiro Kosuge<sup>2</sup>,

<sup>1</sup>European Center for Mechatronics, Germany <sup>2</sup>Tohoku University, Japan

<b>Optimum Method of Working Assignment in Some Welding Robots with Genetic Algorithm</b> .....	232
Yasuyoshi Kaneko, Tatsuo Hosoda, and Kenji Ohshima	
Saitama University	

<b>Sensing and Control of Weld Pool by Fuzzy-Neural Network in Robotic Welding System</b> .....	238
Akira Hirai, Yasuyoshi Kaneko, Tatsuo Hosoda, Satoshi Yamane, and Kenji Oshima Saitama University	
<b>Evaluating the Duration of Message Transactions in Broadcast Wired/Wireless Fieldbus Networks</b> .....	243
Mário Alves <sup>1</sup> , Eduardo Tovar <sup>1</sup> , and Francisco Vasques <sup>2</sup> <sup>1</sup> Polytechnic Institute of Porto, <sup>2</sup> University of Porto	
<b>A Scheduling Framework for Heterogeneous Multiprocessor Architectures Based on Industrial Processors (DSPs and Microcontrollers)</b> .....	249
Adriano Tavares and Carlos Couto University of Minho	
<b>Embedded Java to Enable Jini Facilities in Agricultural Networked Systems</b> .....	255
Carlos Serodio <sup>1</sup> , Pedro Silva <sup>1</sup> , Carlos Couto <sup>2</sup> , and Joao Monteiro <sup>2</sup> <sup>1</sup> UTAD - University of Trás-os-Montes e Alto Douro, <sup>2</sup> University of Minho	

### FA04: Factory Automation III

Wind River B Room, Sunday, Dec 2, 8:00AM to 9:50AM

Session Co-Chairs: Laszlo Horvath<sup>1</sup> and Daniel J. Cox<sup>2</sup>,

<sup>1</sup>Budapest Polytechnic, Hungary <sup>2</sup>The University of Texas at Austin, USA

<b>Systematic Approach for Developing Holonic Manufacturing Execution Systems</b> .....	261
Fan-Tien Cheng, Shang-Lun Wu, and Chih-Feng Chang, National Cheng Kung University	
<b>3-D Vision Systems for Micro-Operation and Its Application</b> .....	267
Daisuke Shima, Seiji Hata, and Ichirou Ishimaru Kagawa University	
<b>Modeling of the Background of Human Activities in Engineering Modeling</b> .....	273
László Horváth and Imre J. Rudas Budapest Polytechnic	
<b>A Multiagent-based Distributed Control Platform for Industrial Flexible Production Systems</b> .....	279
Ronald Schoop, Ralf Neubert, and Armando Walter Colombo Schneider Automation GmbH	

### FA05: Factory Automation IV

Mesa Verde B Room, Sunday, Dec 2, 3:00PM to 4:50PM

Session Co-Chairs: Francis Long<sup>1</sup> and Ren C. Luo<sup>2</sup>,

<sup>1</sup>University of Colorado at Denver, USA <sup>2</sup>National Chung Cheng University, Taiwan

<b>DriveServer - Significantly Reduce in Engineering Expense</b> .....	285
Matthias Riedl, Mario Thron, and Thomas Hadlich IFAK system GmbH	
<b>Flexible manufacturing prototype to process PVC parts</b> .....	289
Paulo Garrudo <sup>1</sup> , Nuno Parreiras <sup>1</sup> , João Conceição <sup>2</sup> , Fernando Barbosa <sup>1</sup> , José Metrôlho <sup>1</sup> , and António Martins <sup>1</sup> <sup>1</sup> Instituto Politécnico de Castelo Branco, <sup>2</sup> DINEFER - Industria de Ferramentas SA	
<b>A Novel Fault Diagnosis Approach for a Class of Discrete Descriptor Systems</b> .....	293
Chen Yudong, Shi Songjiao, and Weng Zhengxin Research Institute of Automation, Shanghai Jiaotong University	
<b>On Dependability Evaluation of Fieldbus Networks: a Permanent Fault Analysis</b> .....	299
Adriano Carvalho and Paulo Portugal Faculdade de Engenharia da Universidade do Porto	

## ME01: Walking, Moving and Flying

Wind Star A Room, Friday, Nov 30, 2:00PM to 3:50PM

Session Co-Chairs: Paul Drews<sup>1</sup> and Wilfried Elmenreich<sup>2</sup>, <sup>1</sup>European Center for Mechatronics, Germany <sup>2</sup>Vienna University of Technology, Austria

<b>Lazy Control Strategy for Active Passive Walking</b> .....	305
Satoshi Suzuki, Katsuhisa Furuta, and Shoshiro Hatakeyama Tokyo Denki University	
<b>Development of Autonomously Mobile Robot with Control System Connected by TCP/IP Network</b> .....	311
Masashi Ohchi <sup>1</sup> , Tatsuya Furukawa <sup>1</sup> , Masayuki Takayama <sup>2</sup> , and Shinji Yanagi <sup>3</sup> <sup>1</sup> Saga University, <sup>2</sup> Honda Motor Co. Ltd, <sup>3</sup> Mitsubishi Electric Co. Ltd	
<b>Sensor-Based Path Planning and Intelligent Steering Control of Nonholonomic Mobile Robots</b> .....	317
Gen'ichi Yasuda <sup>1</sup> and Hiroyuki Takai <sup>2</sup> Nagasaki Institute of Applied Science, <sup>2</sup> Hiroshima City University	
<b>Robust Control Design Based on Identified Model for Autonomous Flight System of an Unmanned Helicopter</b> .....	323
Seiji Hashimoto <sup>1</sup> , Shuichi Adachi <sup>2</sup> , Yasunobu Segawa <sup>2</sup> , Gou Miyamori <sup>3</sup> , and Anzhong Tan <sup>3</sup> <sup>1</sup> Oyama National College of Technology, <sup>2</sup> Utsunomiya University, <sup>3</sup> Kawada Industries, Inc.	
<b>Posture Control for Biped Robot Walking with Foot Toe and Sole</b> .....	329
Taro Takahashi and Atsuo Kawamura Yokohama National University	

## ME02: Load and Dynamics in Motion Control

Wind Star A Room, Friday, Nov 30, 4:00PM to 5:50PM

Session Co-Chairs: Man Hyung Lee<sup>1</sup> and Tatsuya Suzuki<sup>2</sup>, <sup>1</sup>Pusan National University, Korea <sup>2</sup>Nagoya University, Japan

<b>Sliding Mode Control of Direct Drive Robot Using Fuzzy Disturbance Estimation</b> .....	335
Andreja Rojko and Karel Jezernik University of Maribor	
<b>A Unified Numerical Scheme for Calculating Inverse Dynamics of Open/Closed Link Mechanisms</b> .....	341
Daigoro Isobe University of Tsukuba	
<b>Advantages of Torque Unit for Flexible Beam Control</b> .....	345
Jun Kobayashi <sup>1</sup> , Hisataka Kugimachi <sup>2</sup> , and Fujio Ohkawa <sup>1</sup> <sup>1</sup> Kyushu Institute of Technology, <sup>2</sup> (C) Seiko Epson	
<b>Control of Servo Systems in the Presence of Motor-Load Inertia Mismatch</b> .....	351
Jeff Moscrop <sup>1</sup> , Chris Cook <sup>1</sup> , and Peter Moll <sup>2</sup> <sup>1</sup> University of Wollongong, <sup>2</sup> University of Twente	
<b>A Nonlinear Load Simulator for Robot Manipulators</b> .....	357
Hakan Temeltas, Metin Gokasan, and Seta Bogosyan Istanbul Technical University	

### ME03: Identification, Data-Collection and Diagnosis in Mechatronic Systems

Wind River B Room, Saturday, Dec 1, 10:00AM to 11:50AM

Session Co-Chairs: Ali Emadi<sup>1</sup> and Akihisa Ohya<sup>2</sup>, <sup>1</sup>Illinois Institute of Technology, USA

<sup>2</sup>University of Tsukuba, Japan

<b>System Identification using Evolutionary Computation and its Application to Internal Adaptive Model Control</b> .....	363
Toshiro Kumon <sup>1</sup> , Tatsuya Suzuki <sup>2</sup> , Makoto Iwasaki <sup>3</sup> , Matsuzaki Motoaki <sup>1</sup> , Nobuyuki Matsui <sup>3</sup> , and Shigeru Okuma <sup>2</sup>	
<sup>1</sup> Nagoya Industrial Science Research Institute, <sup>2</sup> Nagoya University, <sup>3</sup> Nagoya Institute of Technology	
<b>Using Sensor Fusion in a Time-Triggered Network</b> .....	369
Wilfried Elmenreich and Stefan Pitzek Technische Universität Wien	
<b>Thin Film PZT Pressure/Temperature Sensory Arrays for On-line Monitoring of Injection Molding</b> .....	375
Ren C. Luo and Chih Shan Tsai National Chung Cheng University	
<b>A Study of Self-diagnosis System for an Autonomous Mobile Robot : Coping with Self-Condition using Internal Sensory Information</b> .....	381
Kuniaki Kawabata <sup>1</sup> , Shinnosuke Okina <sup>2</sup> , Teruo Fujii <sup>3</sup> , and Hajime Asama <sup>1</sup> <sup>1</sup> RIKEN, <sup>2</sup> NEC Co., <sup>3</sup> University of Tokyo	
<b>Modeling Vision Inspection System for Fuzzy Logic</b> .....	387
Perfecto Marino, Vicente Pastoriza, Miguel Santamaria, Cesar Siguenza, and Emilio Martinez University of Vigo, Spain	

### ME04: Understanding Mechatronic Environment

Wind River B Room, Saturday, Dec 1, 1:00PM to 2:50PM

Session Co-Chairs: Jang Myung Lee<sup>1</sup> and Daniel J. Cox<sup>2</sup>,

<sup>1</sup>Pusan National University, Korea <sup>2</sup>The University of Texas at Austin, USA

<b>Fast Thresholding Computation by Searching for Zero Derivatives of Image Between-Class Variance</b> .....	393
Ku-Chin Lin Kun Shan University of Technology	
<b>Autonomous Navigation of Mobile Robot based on Teaching and Playback Using Trinocular Vision</b> .....	398
Akihisa Ohya, Yukio Miyazaki, and Shin'ichi Yuta University of Tsukuba	
<b>Radiometric Measures for Feature Selection in Visual Servoing</b> .....	404
M. Ficocelli and F. Janabi Sharifi Ryerson University	
<b>Estimation of Errors in INS with Multiple GPS Antennas</b> .....	410
Sinpyo Hong <sup>1</sup> , Ju Yong Choi <sup>1</sup> , Chang Sup Kim <sup>1</sup> , Man Hyung Lee <sup>1</sup> , and Jason Speyer <sup>2</sup> <sup>1</sup> Pusan National University, <sup>2</sup> University of California, Los Angeles	
<b>Multisensor Based Control of Pet Robot Through the Internet</b> .....	416
Ren C. Luo, Kuo L. Su, Jyh Hwa Tzou, and S. H. Henry Phang National Chung Cheng University	

## ME05: Mechatronic Cooperations and Human Interfaces

Wind River B Room, Sunday, Dec 2, 10:00AM to 11:50AM

Session Co-Chairs: Kazuhiro Kosuge<sup>1</sup> and Hakan Temeltas<sup>2</sup>,

<sup>1</sup>Tohoku University, Japan <sup>2</sup>Istanbul Technical University, Turkey

<b>Cooperative Control and Force Limitation for Multiple Robots in Single Object Transportation.....</b>	422
Kentaro Kato, Kenji Inoue, Tatsuo Arai, and Yasushi Mae Osaka University	
<b>Collective Motion of Interacting Simple Robots .....</b>	428
Ken Sugawara <sup>1</sup> , Masaki Sano <sup>2</sup> , Toshinori Watanabe <sup>1</sup> , Ritsu Arai <sup>1</sup> , Yoshinori Hayakawa <sup>3</sup> , and Tsuyoshi Mizuguchi <sup>4</sup> <sup>1</sup> University of Electro-Communications, <sup>2</sup> University of Tokyo, <sup>3</sup> Tohoku University, <sup>4</sup> Kyoto University	
<b>Automatic Tomato Picking Robot System with Human Interface using Image Processing.....</b>	433
Yoshihiko Takahashi, Jun Ogawa, and Kouichi Saeki Kanagawa Institute of Technology	
<b>Intelligent Cooperative Control System in Visual Welding Robot.....</b>	439
Leila H. Sharif, Satoshi Yamane, Tomotaka Sugimoto, and Kenji Oshima Saitama University	
<b>Development of 6 D.O.F. Haptic Interface for Tele-micromanipulation Systems .....</b>	444
Noriaki Ando, Kazuyuki Morioka, Peter Szemes, and Hideki Hashimoto University of Tokyo / PRESTO, JST	

## ME06: Planning and Actuation for Motion System

Wind River B Room, Sunday, Dec 2, 3:00PM to 4:50PM

Session Co-Chairs: Man Hyung Lee<sup>1</sup> and Kouhei Ohnishi<sup>2</sup>, <sup>1</sup>Pusan National University, Korea <sup>2</sup>Keio University, Japan

<b>Force Control of Remote Maintenance Robot for the ITER .....</b>	450
Koji Takeo <sup>1</sup> , Kazuhiro Kosuge <sup>1</sup> , Kiyoshi Shibamura <sup>2</sup> , and Kiyoshi Oka <sup>2</sup> <sup>1</sup> Tohoku University, <sup>2</sup> Japan Atomic Energy Research Institute	
<b>PID Control of a Novel Two-finger Variable Reluctance Gripper .....</b>	456
Kenneth Kin-Chung Chan and Norbert C. Cheung The Hong Kong Polytechnic University	
<b>Standard Modular Actuator Test and Characterization.....</b>	462
Seong-Ho Kang, Daniel Cox, and Delbert Tesar The University of Texas at Austin	
<b>A Low-Cost Linear Switched Reluctance Motor with Integrated Position Sensor for General-Purpose Three-Phase Motor Controller .....</b>	468
Wai-Chuen Gan <sup>1</sup> and Norbert C Cheung <sup>2</sup> <sup>1</sup> The Hong Kong University of Science and Technology, <sup>2</sup> The Hong Kong Polytechnic University	

## SC01: Signal Processing and Systems 1

Wind River A Room, Thursday, Nov 29, 1:00PM to 2:50PM

Session Co-Chairs: Carlos Couto<sup>1</sup> and M. Farooq<sup>2</sup>,

<sup>1</sup>University of Minho, Portugal <sup>2</sup>Royal Military College of Canada, Canada

<b>A Self-Tuning Fuzzy Filtered-U Algorithm with the Application of Active Noise Control.....</b>	474
Cheng-Yuan Chang <sup>1</sup> and Kuo-Kai Shyu <sup>2</sup> <sup>1</sup> Ching-Yun Institute of Technology <sup>2</sup> National Central University	
<b>High-Speed Modular Multiplication Algorithm for RSA Cryptosystem .....</b>	479
Koon-Shik Cho, Je-Hyuk Ryu, and Jun-Dong Cho SungKyunKwan University	

<b>Fault Diagnosis Using Dynamic Finite-State Automaton Models</b> .....	484
YunXia Xi <sup>1</sup> , KhiangWee Lim <sup>1</sup> , Weng-Khuen Ho <sup>1</sup> , and Heinz A. Preisig <sup>2</sup>	
<sup>1</sup> National University of Singapore, <sup>2</sup> Eindhoven University of Technology	
<b>The Application of Wavelet Singularity Detection in Fault Diagnosis of High Voltage Breakers Using GPS for Accurate Time Synchronization</b> .....	490
Xiaoguang Hu, Yanchao Ji, and Wen-bin Yu	
Harbin Institute of Technology	
<b>Wavelet Transform Based Power Transmission Line Fault Location</b> .....	495
Gi-Taek Kim, Hyuck-Soo Kim, and Jung-Yong Choi	
Kanwon National University	

## SC02: Signal Processing and Systems 2

Wind River A Room, Thursday, Nov 29, 3:00PM to 4:50PM

Session Co-Chair: Rokuya Ishii<sup>1</sup> and John Hung<sup>2</sup>, <sup>1</sup>Yokohama National University, Japan <sup>2</sup>Auburn University, USA

<b>Pareto Near-Optimal Strategy of Multimodeling Systems</b> .....	500
Hiroaki Mukaidani	
Hiroshima City University	
<b>A Relaxation Method for Stable Inversion of Discrete-Time Nonlinear Systems</b> .....	506
David Taylor and Song Li	
Georgia Institute of Technology	
<b>Galerkin-Based Method for a Differential Game of Two-Dimensional Distributions</b> .....	512
Yuichi Sawada <sup>1</sup> , Hiro Mukai <sup>2</sup> , and Rafael de la Guardia <sup>2</sup>	
<sup>1</sup> Kyoto Institute of Technology, <sup>2</sup> Washington University	
<b>Optimized Architecture for a Capacitive Angular Sensor System</b> .....	518
Nikolaus Kerö, Herbert Nachtnebel, and Thilo Sauter	
Vienna University of Technology	
<b>A Proposal of Efficiency Improvement with Solar Power Generation System</b> .....	523
Tetsumi Harakawa <sup>1</sup> and Takahiro Tujimoto <sup>2</sup>	
<sup>1</sup> Maebashi Institute of Technology, <sup>2</sup> Shizuoka University	

## SC03: Signal Processing and Systems 3

Wind River A Room, Thursday, Nov 29, 5:00PM to 6:50PM

Session Co-Chairs: Carlos Couto<sup>1</sup> and John Hung<sup>2</sup>, <sup>1</sup>University of Minho, Portugal <sup>2</sup>Auburn University, USA

<b>Web Tension Control of a Start-up Process using Observer Techniques with Friction and Inertia Compensation</b> .....	529
Ku-Chin Lin <sup>1</sup> , Ming-Ching Tsai <sup>2</sup> , and Kung-Yi Chen <sup>2</sup>	
<sup>1</sup> Kun Shan University of Technology, <sup>2</sup> Cheng Kung University	
<b>A GUI Support System for a Sight Handicapped Person By Using Hand Shape Recognition</b> .....	535
Takuro Niidome and Rokuya Ishii	
Yokohama National University	
<b>An Analog Harmonic Analyzing Meter Using PLLs</b> .....	539
Keiju Matsui <sup>1</sup> , Isamu Yamamoto <sup>1</sup> , and Kazuo Tsuboi <sup>1</sup> ; Fukashi Ueda <sup>2</sup>	
<sup>1</sup> Chubu University, Chubu Electric Power Co., Inc. <sup>2</sup>	
<b>A Throttle Control Algorithm for Improving Engine Response Based on the Characteristics of Electronic-Throttle-Control Actuator</b> .....	546
Toshihiro Aono and Takehiko Kowatari	
Mechanical Engineering Research Lab., Hitachi Ltd.,	

<b>Optimal PID Tuning for Wiener/Hammerstein Nonlinear Systems .....</b>	<b>746</b>
Laszlo Keviczky and Csilla Banyasz Hungarian Academy of Sciences	

**SC04: Robot and Manipulator**

Wind River A Room, Friday, Nov 30, 8:00AM to 9:50AM

Session Co-Chairs: Kouhei Ohnishi<sup>1</sup> and Shigeyasu Kawaji<sup>2</sup>, <sup>1</sup>Keio University, Japan <sup>2</sup>Kumamoto University, Japan

<b>Gain-Scheduled L2-Gain Based Control of a Flexible Parameter-Varying Robot Link.....</b>	<b>552</b>
Jochen M. Rieber and David G. Taylor Georgia Institute of Technology	

<b>Motion Planning for a Manipulator Equipped on an Underwater Robot.....</b>	<b>558</b>
Shojiro Ishibashi, Etsuro Shimizu, and Masanori Ito Tokyo University of Mercantile Marine	

<b>An Application of EKF For The Position Control Of a Single Link Arm.....</b>	<b>564</b>
O. Seta Bogosyan, Metin Gokasan, and Chingiz Hajiyeve Istanbul Technical University	

<b>Fuzzy Model Reference Control of Wheeled Mobile Robots .....</b>	<b>570</b>
H. K. Lam, T. H. Lee, F. H. F. Leung, and P. K. S. Tam The Hong Kong Polytechnic University	

<b>A Practical Fuzzy Logic Controller for the Path Tracking of Wheeled Mobile Robots .....</b>	<b>574</b>
T. H. Lee, H. K. Lam, F. H. F. Leung, and P. K. S. Tam The Hong Kong Polytechnic University	

**SC05: Motor Control 1**

Wind River A Room, Friday, Nov 30, 10:00AM to 11:50AM

Session Co-Chairs: Juan Pimentel<sup>1</sup> and J. David Irwin<sup>2</sup>, <sup>1</sup>Kettering University, USA <sup>2</sup>Auburn University, USA

<b>Grey Feedback Linearization Speed Control for Induction Servo Motor Drive .....</b>	<b>580</b>
Rong-Jong Wai, Rou-Yong Duan, and Li-Jung Chang Yuan Ze University	

<b>Robust Control for LLCC Resonant Linear Piezoelectric Ceramic Motor Drive .....</b>	<b>586</b>
Rong-Jong Wai, Rou-Yong Duan, Kuan-Yun Hsieh, and Jeng-Dao Lee Yuan Ze University	

<b>Rotor Eccentricity Fault Detection of a DC Motor .....</b>	<b>591</b>
Masoud Haji and Hamid Toliyat Texas A&M University	

<b>Real-Time fuzzy logic Controller for a DC Drive System.....</b>	<b>597</b>
Refaat Ahmed Helwan University	

<b>Design of Robust Controllers with Constraints on the Control Signal - Application for Brushless D.C. Drives .....</b>	<b>603</b>
Alexandru Forrai, S. Hashimoto, H. Funato, and K. Kamiyama Utsunomiya University	

## SC06: Motor Control 2

Wind River A Room, Friday, Nov 30, 2:00PM to 3:50PM

Session Co-Chairs: Michael Greene<sup>1</sup> and Andrea Tilli<sup>2</sup>, <sup>1</sup>Auburn University, USA <sup>2</sup>University of Bologna, Italy

<b>Efficient Position Encoding in Hard Disk Drive using Dual Frequency Servo Bursts</b> .....	609
Abdullah Al Mamun, Tong Heng Lee, and Gek Hung Tay National University of Singapore	
<b>Design of a Pole Placement Controller for Reducing Oscillation and Settling Time in a Two-Inertia Motor System</b> .....	615
Gloria Suh, Dae Sung Hyun, Jung Il Park, Ki Dong Lee, and Suk Gyu Lee Yeungnam University	
<b>A Design of Touch Detection Algorithm for Bonding Tip of Wire Bonder Machine</b> .....	621
Jung-Han Kim <sup>1</sup> and <sup>2</sup> Jun-Ho Oh <sup>1</sup> Samsung Techwin, <sup>2</sup> Kaist	
<b>A Path Planning Method for Micro Robot Soccer Game</b> .....	626
T. H. Lee, H. K. Lam, F. H. F. Leung, and P. K. S. Tam The Hong Kong Polytechnic University	
<b>Sensorless Torque Control of AC Induction Motors</b> .....	630
Haithem Abu-Rub <sup>1</sup> , Jaroslaw Guzinski <sup>2</sup> , Shehab Ahmed <sup>1</sup> , and Hamid Toliyat <sup>1</sup> Texas A&M University, <sup>2</sup> Technical University of Gdansk	

## SC07: Motor Control 3

Wind River A Room, Friday, Nov 30, 4:00PM to 5:50PM

Session Co-Chairs: J. David Irwin and Michael Greene, Auburn University, USA

<b>Nonlinear Decoupled Control for Linear Induction Motor Servo Drive</b> .....	635
Rong-Jong Wai, Rou-Yong Duan, Wei-Kuo Liu, and Sheng-Po Yu Yuan Ze University	
<b>Simple Sensorless Vector Control of Induction Motors with Natural Field Orientation</b> .....	641
Sergei Peresada <sup>1</sup> , Andrea Tilli <sup>2</sup> , Sergei Kovbasa <sup>1</sup> , Marcello Montanari <sup>2</sup> , and Fabio Ronchi <sup>2</sup> <sup>1</sup> National Technical University of Ukraine, <sup>2</sup> University of Bologna	
<b>Evaluation of a New Strategy for Controlling Induction Motors Without Using Speed Sensors</b> .....	647
Luís Fernando Alves Pereira and José Felipe Haffner Pontifícia Universidade Católica do Rio Grande do Sul - PUCRS	
<b>Induction Motor Speed Estimation: Limitations of Certain Neural Schemes Based on Time Instances of Periodic Signals</b> .....	653
Bartłomiej Beliczynski and Lech Grzesiak Warsaw University of Technology	
<b>Detection of Broken Rotor Bar of Induction Motors by Spectral Analysis of the Electromagnetic Torque Using the Luenberger Observer</b> .....	658
Mario Eltabach, Ali Charara, Ismail Zein, and Ménad Sidahmed, Heudiasyc - Université de Technologie de Compiègne	

## SC08: Quality Monitoring

Wind River A Room, Saturday, Dec 1, 8:00AM to 9:50AM

Session Co-Chairs: H.K. Lam<sup>1</sup> and Ivan Godler<sup>2</sup>, <sup>1</sup>The Hong Kong Polytechnic University, Hong Kong

<sup>2</sup>Kitakyushu University, Japan

- A Multi-step Approach for Modeling MIMO Systems from Input-Output Data** ..... 664  
Srinivasan Himavathi and Bhaskaran Umamaheswari  
Anna University
- Wavelet Approach to Power Quality Monitoring** ..... 670  
Tao Lin, Mineo Tsuji, and Eiji Yamada  
Nagasaki University
- An Enhanced Data Compression Method for Applications in Power Quality Analysis** ..... 676  
Moisés Vidal Ribeiro<sup>1</sup>, Carlos A. Duque<sup>2</sup>, and João Marcos T. Romano<sup>1</sup>  
<sup>1</sup>State University of Campinas - UNICAMP, <sup>2</sup>Federal University of Juiz de Fora - UFJF
- On Monitoring the State of Electrodes in Arc Furnaces for Silicon Production** ..... 682  
Jose Farina<sup>1</sup>, Juan J. Rodriguez-Andina<sup>1</sup>, Javier Bullon<sup>2</sup>, and Angel Lorenzo<sup>2</sup>  
<sup>1</sup>University of Vigo, <sup>2</sup>Ferroatlantica I+D
- The New Method of Monitoring DC System Insulation On-line**..... 688  
Chengyong Zhao<sup>1</sup>, Xiufang Jia<sup>1</sup>, and Zhifang Hao<sup>2</sup>  
<sup>1</sup>North China Electric Power University, <sup>2</sup>Yangquan Electric Power Company

## SC09: Systems and Control

Wind River A Room, Saturday, Dec 1, 10:00AM to 11:50AM

Session Co-Chairs: Jan T. Bialasiewicz<sup>1</sup> and Ivan Godler<sup>2</sup>, <sup>1</sup>University of Colorado at Denver, USA

<sup>2</sup>Kitakyushu University, Japan

- Robust Servo System Design Giving Consideration to Transient Behavior for a Linear System with Structured Uncertainties** ..... 692  
Hidetoshi Ooya and Kojiro Hagino  
University of Electro-Communications
- Decoupling Design of Robust Control Systems for SCARA Robots Using Adaptive Pole Placement** ..... 698  
Naoki Uchiyama and Shoji Takagi  
Toyohashi University of Technology
- A Novel Robust Fault Identification Approach for a Class of Discrete Systems** ..... 704  
Chen Yudong, Shi Songjiao, and Weng Zhengxin  
Shanghai Jiaotong University
- H<sup>∞</sup> Control for Discrete-time Linear Systems with Time-varying Delays in State**..... 707  
Ki Tae Kim<sup>1</sup>, Sang Hyun Cho<sup>1</sup>, Kyung Ho Bang<sup>2</sup>, and Hong Bae Park<sup>1</sup>  
<sup>1</sup>Kyungpook National University, <sup>2</sup>Myongji College
- Design of Robust Safety Controller for Model Following By Using a Genetic Algorithm** ..... 712  
Rongyan Zhu and Yuzo Yamane  
Ashikaga Institute of Technology

## SC10: PID Control 1

Wind River A Room, Sunday, Dec 2, 10:00AM to 11:50AM

Session Co-Chairs: Norbert C. Cheung<sup>1</sup> and Shigeyasu Kawaji<sup>2</sup>,

<sup>1</sup>Hong Kong Polytechnic University, Hong Kong <sup>2</sup>Kumamoto University, Japan

- A GA-Optimized Fuzzy PD+I Controller for Nonlinear Systems** ..... 718  
K S. Tang, K F. Man, G. R. Chen, and Sam Kwong  
City University of Hong Kong

<b>Multivariable PID Controller Design via Frequency Response Approximation of the Attainable Performance</b> .....	724
Sabine Pegel and Sebastian Engell University of Dortmund	
<b>Dynamic Loop Interactions and Multi-loop PID Controller Design</b> .....	730
Hsiao-Ping Huang, Jyh-Cheng Jeng, and Chih-Hung Chiang National Taiwan University	
<b>Automatic Tuning of PID Controllers Using Model Reference Adaptive Control Techniques</b> .....	736
Kandisami Pirabakaran and Victor Becerra University of Reading	

### SC11: PID Control 2

Wind River A Room, Sunday, Dec 2, 1:00PM to 2:50PM

Session Co-Chairs: Jan T. Bialasiewicz<sup>1</sup> and Robert Begun<sup>2</sup>,

<sup>1</sup>University of Colorado at Denver, USA

<b>Robust Tuning of a Dead-Time Compensator</b> .....	741
Otacilio Almeida <sup>1</sup> and Antonio Coelho <sup>2</sup> <sup>1</sup> Federal University of Ceara, <sup>2</sup> Federal University of Santa Catarina	
<b>PID Tuning for Classical Robustness Specifications by Enumeration Methods</b> .....	752
James Crowe <sup>1</sup> and Michael Johnson <sup>2</sup> <sup>1</sup> Roche Products Ltd, <sup>2</sup> University of Strathclyde	
<b>Robust Self-Tuning PID Controller for Nonlinear Systems</b> .....	758
Kok Kiong Tan, Sunan Huang, and Raihana Ferdous National University of Singapore	

### SC12: PID Control 3

Wind River A Room, Sunday, Dec 2, 3:00PM to 4:50PM

Session Co-Chairs: Robert Begun<sup>1</sup> and Karel Jezernik<sup>2</sup>, <sup>2</sup>University of Maribor, Slovenia

<b>Predictive PID Control: A New Algorithm</b> .....	764
Mohammad H. Moradi, M.R. Katebi, and M.A. Johnson University of Strathclyde	
<b>Control of Bakers Yeast Fermentation: PID and Fuzzy Algorithms</b> .....	770
Carlos Machado, Pedro Gomes, Rui Soares, Sílvia Pereira, and Filomena Soares Universidade do Minho	
<b>On the Design of Multivariable PID Controllers via LMI Approach</b> .....	776
Feng Zheng, Qing-Guo Wang, and Tong Heng Lee National University of Singapore	
<b>Fuzzy Adaptive Approach to Nonlinear Systems Control</b> .....	782
Noureddine Golea <sup>1</sup> , Amar Golea <sup>2</sup> , Mohamed Boumehez <sup>2</sup> , and Mohamed Kadjoudj <sup>2</sup> <sup>1</sup> Oum El-Bouaghi University, <sup>2</sup> Biskra University	
<b>Development of Fuzzy PID Control System for Hot Strip Finishing Mill</b> .....	787
Cheol Jae Park, Duk Man Lee, and Seung Gap Choi POSCO Technical Research Labs	

## PE Panel Discussion: Recent Advances and Trends in Power Electronics and Motor Drives.

Grand Mesa F Room, Friday, Nov 30, 2001, 1:00 PM – 4:50 PM

Organizer and Chair: Dr. Bimal K. Bose, University of Tennessee, USA (bbose@utk.edu)

Panelists:

### Power Semiconductor Devices:

Dr. Allen Hefner, National Inst. of Standards and Technology, USA (hefner@nist.gov)

### Electrical Machines for Drives:

Dr. Silverio Bolognani, University of Padova, Italy (bolognan@dei.unipd.it)

### Power Converters:

Dr. Hirofumi Akagi, Tokyo Institute of Technology, Japan (akagi@ee.titech.ac.jp)

### Advanced Control of Drives:

Dr. Marian Kazmierkowski, Warsaw University of Technology, Poland (mpk@isep.pw.edu.pl)

### AI Techniques in Power Electronics: and Drives:

Dr. Marcelo Simoes, Colorado School of Mines, USA (m.g.simoes@ieee.org)

### Sensorless Control of Drives:

Dr. Joachim Holtz, Germany (j.holtz@ieee.org)

## PE01: Devices and Components

Wind Star A Room, Thursday, Nov 29, 1:00PM to 2:50PM

Session Co-Chairs: Hirofumi Akagi<sup>1</sup> and Makoto Iwasaki<sup>2</sup>,

<sup>1</sup>Tokyo Institute of Technology, Japan <sup>2</sup>Nagoya Institute of Technology, Japan

<b>Power Losses of IGBTs in an Inverter Prototype for High Frequency Inductive Heating Applications</b> .....	792
Ulrich Schwarzer and Rik W. De Doncker Institute for Power Electronics and Electrical Drives (ISEA), RWTH Aachen	
<b>Resin Molded Type of Voltage-Current Sensor for Real-time Measurement of Power Factor in Power Distribution Systems</b> .....	799
Tatsuya Furukawa <sup>1</sup> , Manabu Ashikawa <sup>2</sup> , Yoshiyuki Ueda <sup>3</sup> , and Masashi Ohchi <sup>1</sup> , <sup>1</sup> Saga University, <sup>2</sup> Hitachi Software Engineering Co., <sup>3</sup> Koyo Electric Industry Co.	
<b>Comparison of Switching Devices in Scalable Switch Concept for Medium Voltage Medium Frequency Power Conversion</b> .....	805
Jochen Mast <sup>1</sup> , Guntram Scheible <sup>2</sup> , and Henry Gueldner <sup>1</sup> <sup>1</sup> University of Dresden, <sup>2</sup> ABB Corporate Research	
<b>A Novel Trench-type IGBT Having Superior Electrical Characteristics</b> .....	811
Ey Goo Kang, Seung Hyun Moon, Sangsig Kim, and Man Young Sung Korea University	
<b>Simulation of a Lateral Trench IGBT with p+ Diverter for Improving Latch-up Characteristics</b> .....	816
Ey Goo Kang, Seung Hyun Moon, Sangsig Kim, and Man Young Sung Korea University	

## PE02: DC – DC Converters – 1

Wind Star B Room, Thursday, Nov 29, 1:00PM to 2:50PM

Session Co-Chairs: Regan Zane<sup>1</sup> and Nicola Femia<sup>2</sup>, <sup>1</sup>University of Colorado, USA <sup>2</sup>University of Salerno, Italy

<b>A Generalized Framework for Sampled-Data Model Analysis of Closed-Loop PWM DC-DC Converter System</b> .....	820
Muhammad Mansoor Khan and Wu Zhi-Ming Shanghai Jiaotong University	

<b>Modeling PWM DC-DC Converter as Discrete Input/Continuous Output System and its Application to System Local Controllability</b> .....	826
Muhammad Mansoor Khan and Wu Zhi-Ming Shanghai Jiaotong University	
<b>Developed Tools for an Optimization Approach, Application to Optimize a Flyback Structure Volume under EMC and Loss Constraints</b> .....	832
Chérif Larouci <sup>1</sup> , Eric Atienza <sup>1</sup> , Jean-Paul Ferrieux <sup>1</sup> , Laurent Gerbaud <sup>1</sup> , and James Roudet <sup>1</sup> Laboratoire d'Electrotechnique de Grenoble	
<b>Averaged Switch Modeling of Boundary Conduction Mode DC-to-DC Converters</b> .....	844
Jingquan Chen, Robert Erickson, and Dragan Maksimovic University of Colorado at Boulder	

### PE03: Soft-switched Converters – 1

Wind Star A Room, Thursday, Nov 29, 3:00PM to 4:50PM

Session Co-Chairs: In-Dong Kim<sup>1</sup> and Javier Uceda<sup>2</sup>,

<sup>1</sup>Pukyong National University, Korea <sup>2</sup>Universidad Politecnica de Madrid, Spain

<b>Practical Design Approach of A Single Inductor Type Active Resonant AC Link Snubber for Voltage-Fed Soft Switching Inverter and Feasible Performance Evaluations</b> .....	850
Masanobu Yoshida, Eiji Hiraki, and Mutsuo Nakaoka Yamaguchi University	
<b>Active Edge-Resonant DC Link Snubber-Assisted Three Phase Soft Switching Inverter for AC Servo Drive</b> .....	856
Junji Yoshitsugu <sup>1</sup> , Kenji Inoue <sup>2</sup> , Eiji Hiraki <sup>1</sup> , and Mutsuo Nakaoka <sup>1</sup> <sup>1</sup> Yamaguchi University, <sup>2</sup> Shinko Electric Co., Ltd.	
<b>Control Parameter Selection in Auxiliary Resonant Commutated Pole Converters</b> .....	862
Ralph Teichmann ABB Corporate Research	
<b>A Novel Control Scheme for the Actively Clamped Resonant DC-Link Inverter</b> .....	870
Dehua Zhang, Jianping Ying, Qian Liu, Teng Liu, and Fanbin Wang Zhejiang University-Yuquan Campus	
<b>Practical Simulator Development for Power Loss Performance Analysis of Soft Switching and Hard Switching PWM Inverters using IGBTs</b> .....	876
Eiji Hiraki and Mutsuo Nakaoka Yamaguchi University	

### PE04: DC – DC Converters – 2

Wind Star B Room, Thursday, Nov 29, 3:00PM to 4:50PM

Session Co-Chairs: Nicola Femia<sup>1</sup> and Ramu Krishnan<sup>2</sup>, <sup>1</sup>University of Salerno, Italy, <sup>2</sup>Virginia Polytechnic Institute, USA

<b>Self-Tuned Dither Control Of Buck Converter</b> .....	882
Mohamed Ghazy and Amr Amin Helwan University	
<b>A Constant Sampled Current Controller for Active Boost Rectifiers</b> .....	888
Ching-Tsai Pan and Yi-Shuo Huang National Tsing Hua University	
<b>Design and Implementation of a Digital PWM Controller for a High-Frequency Switching DC-DC Power Converter</b> .....	893
Aleksandar Prodic, Dragan Maksimovic, and Robert Erickson University of Colorado at Boulder	

**Fuzzy Control of DC-DC Switching Converters: Stability and Robustness Analysis** ..... 899  
 H. K. Lam, T. H. Lee, F. H. F. Leung, and P. K. S. Tam  
 The Hong Kong Polytechnic University

**PE05: Multi-level Converters**

Wind Star A Room, Thursday, Nov 29, 5:00PM to 6:50PM

Session Co-Chairs: Hamid Toliyat<sup>1</sup> and Fahimi Babak<sup>2</sup>, <sup>1</sup>Texas A&M University, USA <sup>2</sup>Electro Standards Laboratories

**A Generalized Undeland Snubber for Flying Capacitor Multilevel Inverter and Converter** ..... 903  
 In-Dong Kim<sup>1</sup>, Eui-Cheol Nho<sup>1</sup>, Cheol-Je Joe<sup>1</sup>, and Min-Soo Lee<sup>2</sup>  
<sup>1</sup>Pukyong National University, <sup>2</sup>Hyundai Heavy Industries Co. Ltd

**An Improved Output Short-Circuit Protection for Multilevel PWM Rectifier** ..... 909  
 Eui-Cheol Nho<sup>1</sup>, In-Dong Kim<sup>1</sup>, Tae-Won Chun<sup>2</sup>, Heung-Geun Kim<sup>3</sup>, and Cheol-Je Joe<sup>1</sup>  
<sup>1</sup>Pukyong National University, <sup>2</sup>University of Ulsan,  
<sup>3</sup>Kyungpook National University

**A Generalized Control Scheme For Active Front-End Multilevel Converters** ..... 915  
 Franco Hernández<sup>1</sup>, Luis Morán<sup>2</sup>, José Espinoza<sup>2</sup>, and Juan Dixon<sup>3</sup>  
<sup>1</sup>Universidad del Bío Bío, <sup>2</sup>Universidad de Concepción, <sup>3</sup>Universidad Católica

**DSP-Based Online Optimal PWM Multilevel Control For Fuel Cell Power Conditioning Systems** ..... 921  
 Naziha Ahmad Azli and Abdul Halim Mohd Yatim  
 Universiti Teknologi Malaysia

**Reactive Power Control in Distribution System using an N.P.C INVERTER Topology** ..... 927  
 Mustapha Benganem, Azzeddine Draou, and Ali Tahri  
 University of Sciences and Technology of Oran

**PE06: Power Factor and PWM Control**

Wind Star B Room, Thursday, Nov 29, 5:00PM to 6:50PM

Session Co-Chairs: Regan Zane<sup>1</sup> and Novica Losic<sup>2</sup>, <sup>1</sup>University of Colorado, USA <sup>2</sup>Honeywell, Canada

**Single-Stage High Power Factor Converter with Single-Switch for Universal Input** ..... 931  
 Hag-Wone Kim<sup>1</sup>, Gun-Woo Moon<sup>1</sup>, Kwan-Youl Cho<sup>2</sup>, and Myung-Joong Youn<sup>1</sup>  
<sup>1</sup>Korea Advanced Institute of Science and Technology, <sup>2</sup>LG Electronics Co. Ltd.

**Single-Phase Unity Power-Factor Double Buck Rectifier: Topology, Operation and Control** ..... 937  
 Vitor Fernaldo Pires<sup>1</sup> and Jose Fernando Silva<sup>2</sup>  
<sup>1</sup>ESTS -IPS, <sup>2</sup>CAUTL

**A Simple Digital Hardware to Control a PFC Converter** ..... 943  
 Pablo Zumel, Angel Castro, Oscar Garcia, Teresa Riesgo, and Javier Uceda  
 Universidad Politecnica de Madrid

**A Single-Phase Active Power Filter with Double Edge Integration Control** ..... 949  
 Sergio Serena, Chongming Qiao and Keyue Smedley  
 University of California Irvine

**PE07: Soft Switching Converters – 2**

Wind Star A Room, Friday, Nov 30, 8:00AM to 9:50AM

Session Co-Chairs: Javier Uceda<sup>1</sup> and Ralph Teichmann<sup>2</sup>,

<sup>1</sup>Universidad Politecnica de Madrid, Spain <sup>2</sup>ABB Corporate Research, Germany

**A Novel AC-PDP Sustaining Drive Based on Dual Resonance in Sustaining Mode Operation** ..... 954  
 Feel-Soon Kang<sup>1</sup>, Sung-Jun Park<sup>2</sup>, and Cheul-U Kim<sup>1</sup>  
<sup>1</sup>Pusan national University, <sup>2</sup>Tong-Myong College

**Modeling and Analysis of a Self-Oscillating Peak-Current Controlled Flyback Converter** ..... 960  
 Juha Lempinen<sup>1</sup> and Teuvo Suntio<sup>2</sup>

DIARC-Technology Oy, <sup>2</sup>University of Oulu

<b>Asymmetrical Operation of Resonant Converters Studied by Common and Differential Mode Components</b> .....	966
Janos Hamar and Istvan Nagy Budapest University of Technology and Economics	
<b>Analysis of Switching-Invariant Characteristics of Soft-Switching Cells</b> .....	972
Luigi Egiziano <sup>1</sup> , Nicola Femia <sup>1</sup> , Giovanni Spagnuolo <sup>1</sup> , and Massimo Vitelli <sup>2</sup> <sup>1</sup> University of Salerno <sup>2</sup> Second University of Naples	
<b>Steady-State Analysis Of Soft-Switching Converters</b> .....	978
Luigi Egiziano <sup>1</sup> , Nicola Femia <sup>1</sup> , Giovanni Spagnuolo <sup>1</sup> , and Massimo Vitelli <sup>2</sup> <sup>1</sup> University of Salerno, <sup>2</sup> Second University of Naples	

## **PE08: Modeling and Simulation of Converters**

Wind Star B Room, Friday, Nov 30, 8:00AM to 9:50AM

Session Co-Chairs: Maria Ines Valla<sup>1</sup> and Keyue M. Smedley<sup>2</sup>,

<sup>1</sup>Facultad de Ingenieria UNLP, Argentina <sup>2</sup>University of California, USA

<b>Performance Indices for a Stochastic Model of a Power Electronic Converter</b> .....	984
Anawach Sangswang and Chika Nwankpa Drexel University	
<b>Modeling and Simulation of a Distribution STATCOM using Simulink's Power System Blockset</b> .....	990
Pierre Giroux <sup>1</sup> , Gilbert Sybille <sup>1</sup> , and Hoang Le-Huy <sup>2</sup> <sup>1</sup> IREQ Hydro-Quebec, <sup>2</sup> Laval University	
<b>Modeling Strategies of Cheju-Haenam HVDC System and Its Dynamic Performance Study</b> .....	995
Chan-ki Kim, Byeong-Mo Yang, and Gil-Jo Jung KEPRI (Korea Electric Power Research Institute)	
<b>Modeling and Analysis of Multi-Converter DC Power Electronic Systems using the Generalized State Space Averaging Method</b> .....	1001
Ali Emadi Illinois Institute of Technology	
<b>Modeling of Power Electronic Loads in AC Distribution Systems Using the Generalized State Space Averaging Method</b> .....	1008
Ali Emadi Illinois Institute of Technology	

## **PE09: HF Converter Applications**

Wind Star A Room, Friday, Nov 30, 10:00AM to 11:50AM

Session Co-Chairs: Ali Emadi<sup>1</sup> and Ching-Tsai Pan<sup>2</sup>, <sup>1</sup>Illinois Institute of Technology, USA<sup>2</sup> National Tsing Hua University, Taiwan

<b>Model-Reference Adaptive Control of a PFC-Equipped Battery-Charger Application</b> .....	1015
Shahrokh Farhangi <sup>1</sup> , Amirnaser Yazdani <sup>1</sup> , and Babak Fahimi <sup>2</sup> <sup>1</sup> University of Tehran, <sup>2</sup> Electro Standards Laboratories	
<b>Study of Output Power Variation Due to Component Tolerances in LC<sub>s</sub>C<sub>p</sub> Resonant Inverters Applied to HPS Lamp Control</b> .....	1021
Christian Brañas, Francisco Azcondo, and Salvador Bracho University of Cantabria	
<b>Current Source LCC Resonant Converter for an EDM Power Supply</b> .....	1027
Rosario Casanueva, Luis A.Chiquito, Francisco J.Azcondo, and Salvador Bracho University of Cantabria	

<b>A Novel Method of Using Second-Order Lamp Model to Design Dimmable Fluorescent Lamps Electronic Ballast</b> .....	1033
Chun-An Cheng, Tsong-Juu Liang, Chia-Ming Chuang, and Jiann-Fuh Chen National Cheng Kung University	

<b>Self-Oscillating Dimmable Electronic Ballast</b> .....	1038
ÁLysson Seidel, Fábio Bisogno, Ricardo do Prado, Humberto Pinheiro, and Rafael Pavão Universidade Federal de Santa Maria	

**PE10: Analysis and Design of Converters - 1**

Wind Star B Room, Friday, Nov 30, 10:00AM to 11:50AM

Session Co-Chairs: Keiju Matsui<sup>1</sup> and Ralph Teichman<sup>2</sup>, <sup>1</sup>Chubu University, Japan <sup>2</sup>ABB Corporate Research, Germany

<b>New Concepts for Matrix Converter Design</b> .....	1044
Jochen Mahlein <sup>1</sup> , Jörg Weigold <sup>1</sup> , and Olaf Simon <sup>2</sup> <sup>1</sup> University of Karlsruhe / ETI, <sup>2</sup> Siemens Erlangen /	

<b>General Stability Criteria for Zero Phase Angle Controlled Loosely Coupled Inductive Power Transfer Systems</b> .....	1049
Chwei-Sen Wang, Grant Covic, and Oskar Stielau The University of Auckland	

<b>Spectral Analysis of DC Link Ripple Currents in Three-Phase AC/DC/AC PWM Converters Feeding AC Machines</b> .....	1055
Young-Wook Park, Dong-Choon Lee, and Jul-Ki Seok School of Electrical Engineering and Computer Science, Yeungnam University	

<b>Effects of Silicon Carbide (SiC) Power Devices on HEV PWM Inverter Losses</b> .....	1061
Burak Ozpineci, Leon M. Tolbert, Syed K. Islam, and Md. Hasanuzzaman The University of Tennessee Knoxville	

<b>Design and Realization of a New Hybrid Power Filter System Used in Single-Phase Circuit</b> .....	1067
Chengyong Zhao, Gengyin Li, Zhiye Chen, and Guangkai Li North China Electric Power University	

**PE11: Modeling and Analysis of Converters and Components**

Wind Star A Room, Saturday, Dec 1, 8:00AM to 9:50AM

Session Co-Chairs: Hoang Le-Huy<sup>1</sup> and Keiju Matsui<sup>2</sup>, <sup>1</sup>Laval University, Canada <sup>2</sup>Chubu University, Japan

<b>Dynamic Effects of Inductor Current Ripple in Peak-Current and Average-Current Mode Control</b> .....	1072
Teuvo Suntio <sup>1</sup> , Matti Rahkala <sup>1</sup> , Idris Gadoura <sup>2</sup> , and Kai Zenger <sup>2</sup> <sup>1</sup> University of Oulu, <sup>2</sup> Helsinki University of Technology	

<b>Averaged Switch Modeling of Active-Clamped Converters</b> .....	1078
Praneet Athalye, Dragan Maksimovic, and Robert Erickson University of Colorado at Boulder	

<b>Instantaneous Power of Power Circuit Including Three Phase Variable Inductance</b> .....	1084
Hirohito Funato Utsunomiya University	

<b>Asymmetrical Group-Pulse-Width-Modulated Technique for Eliminating Striation in the Dimmable Fluorescent Lamps</b> .....	1090
Guan-Chyun Hsieh <sup>1</sup> , Wei-Hsiang Liu <sup>1</sup> , Chang-Hua Lin <sup>1</sup> , and Hung-I Hsieh <sup>2</sup> <sup>1</sup> National Taiwan Univ. of Science and Technology, <sup>2</sup> National Chiao-Tung University	

## PE12: PWM Voltage Source Rectifiers

Wind Star B Room, Saturday, Dec 1, 8:00AM to 9:50AM

Session Co-Chairs: In-Dong Kim<sup>1</sup> and Dorin O. Neacsu<sup>2</sup>,

<sup>1</sup>Pukyong National University, Korea <sup>2</sup>SatCon Applied Technology, USA

<b>Modeling and Design of a Vector-Controlled PWM Active Rectifier</b> .....	1096
Novica Losic, Louis Cheng, and Vijay Khatri Honeywell	
<b>Design and Performance Evaluation of a Generalized Virtual Sensor for Three-Phase PWM AC/DC Converters</b> .....	1102
Jose R. Espinoza <sup>1</sup> , Marcelo A. Pérez <sup>1</sup> , Geza Joos <sup>2</sup> , and Luis Moran <sup>1</sup> <sup>1</sup> Concepcion University, <sup>2</sup> Concordia University	
<b>Reactive Power Compensation Capabilities as a Function of Parasitic Components in Three-Phase AC/DC Voltage and Current Source Rectifiers</b> .....	1108
Jose R. Espinoza <sup>1</sup> , Ernesto Araya <sup>1</sup> , Geza Joos <sup>2</sup> , and Luis Moran <sup>1</sup> <sup>1</sup> Concepcion University, <sup>2</sup> Concordia University	
<b>A Comparative Study of Control Techniques for PWM Rectifiers in AC Adjustable Speed Drives</b> .....	1114
Mariusz Malinowski <sup>1</sup> , Andrzej Trzynadlowski <sup>2</sup> , and Marian Kazmierkowski <sup>1</sup> <sup>1</sup> Warsaw University of Technology, <sup>2</sup> University of Nevada, Reno	
<b>Extended Voltage Swell Ride-Through Capability for PWM Voltage Source Rectifiers</b> .....	1119
Rolando Burgos and Eduardo Wiechmann University of Concepcion	

## PE13: Active Filters

Wind Star A Room, Saturday, Dec 1, 10:00AM to 11:50AM

Session Co-Chairs: Hamid Toliyat<sup>1</sup> and Leon M. Tolbert<sup>2</sup>,

<sup>1</sup>Texas A&M University, USA <sup>2</sup>The University of Tennessee, USA

<b>A Fast Current Control Technique for Active Filters with Low Switching Frequency</b> .....	1125
Jost Allmeling and Herbert Stemmler ETH Zurich	
<b>The Distribution STATCOM for Reducing the Effect of Voltage Sag and Swell</b> .....	1132
Sung-Min Woo, Dae-Wook Kang, Woo-Chol Lee, and Dong-Seok Hyun HanYang University	
<b>Direct Current Control: A novel Control Strategy for Harmonic and Reactive Compensation with Active Filters under Unbalanced Operation</b> .....	1138
Juanma Carrasco <sup>1</sup> , Eduardo Galvan <sup>1</sup> , Manolo Perales <sup>1</sup> , Gerardo Escobar <sup>2</sup> , Alex Stankovic <sup>2</sup> , and Paolo Mattavelli <sup>3</sup> <sup>1</sup> University of Seville, <sup>2</sup> Northeastern University, <sup>3</sup> University of Padova	
<b>Control of Series Active Power Filters Compensating for Source Voltage Unbalance and Current Harmonics</b> .....	1144
G-Myoung Lee and Dong-Choon Lee Yeungnam University	
<b>A Full Compensating System for General Loads, Based on a Combination of Thyristor Binary Compensator, and a PWM-IGBT Active Power Filter</b> .....	1150
Juan Dixon <sup>1</sup> , Yamille del Valle <sup>1</sup> , Marcos Orchard <sup>1</sup> , Micah Ortúzar <sup>1</sup> , Luis Morán <sup>2</sup> , and Carlos Maffrand <sup>3</sup> <sup>1</sup> Catholic University of Chile, <sup>2</sup> University of Concepción, <sup>3</sup> University of Rio Cuarto	

## PE14: Control of Induction Motor Drives – 1

Wind Star B Room, Saturday, Dec 1, 10:00AM to 11:50AM

Session Co-Chairs: Bimal K. Bose<sup>1</sup> and Ashwin Khambadkone<sup>2</sup>, <sup>1</sup>University of Tennessee, USA

<sup>2</sup>National University of Singapore, Singapore

<b>Self-Decoupling Control of High Performance Induction Motor Drive</b> .....	1156
Kuo-Kai Shyu and Kuan-Taa Pan, National Central University	
<b> I<sub>q</sub>  Added Flux Weakening Strategy for the Rotor Flux Oriented Control of a Sinusoidal PWM VSI-fed Induction Motor</b> .....	1160
Feri Yusivar, Takahiro Kihara, Mitsuhiro Sato, Shinji Wakao, and Tsugio Yamamura Waseda University	
<b>DSP Based Space Vector PWM Drive for Constant Power Operation of Two-Phase Induction Motors</b> .....	1166
M.A. Jabbar, A.M. Khambadkone, and Zhang Yanfeng National University of Singapore	
<b>FPGA Implementation of an Universal Space Vector Modulator</b> .....	1172
Mauricio Tonelli, Pedro Battaiotto, and María Valla LEICI - National University of La Plata	

## PE15: Control of Converters

Wind Star A Room, Saturday, Dec 1, 1:00PM to 2:50PM

Session Co-Chairs: Ching-Tsai Pan<sup>1</sup> and Gui-Jia Su<sup>2</sup>,

<sup>1</sup>National Tsing Hua University, Taiwan <sup>2</sup> Oak Ridge National Laboratory, USA

<b>A Novel Control Strategy for High-Power High-Performance AC Power Supplies</b> .....	1178
Lu Jialin and Su Yanmin, Xi'an Jiaotong University	
<b>A New On-Line Dead-Time Compensation Method Based on Time Delay Control</b> .....	1184
Hyun-Soo Kim, Hag-Wone Kim, and Myung-Joong Youn KAIST	
<b>The Robust Control of PWM Power Amplifier by the Approximate 2-Degree-of-Freedom Digital Integral Type Control System</b> .....	1190
Kohji Higuchi <sup>1</sup> , Kazushi Nakano <sup>1</sup> , Kuniya Araki <sup>2</sup> , and Fumiho Chino <sup>2</sup> <sup>1</sup> The University of Electro-Communications, <sup>2</sup> NF Electronic Instruments	
<b>Predictive Current Control of Voltage Source Inverter</b> .....	1195
Haithem Abu-Rub <sup>1</sup> , Jaroslaw Guzinski <sup>2</sup> , Zbigniew Krzeminski <sup>2</sup> , and Hamid Toliyat <sup>3</sup> <sup>1</sup> Birzeit University, <sup>2</sup> Technical University of Gdansk <sup>3</sup> Texas A&M University	
<b>Study of Bifurcation and Chaos in the Current-Mode Controlled Buck-Boost DC-DC Converter</b> .....	838
K.W.E. Cheng <sup>1</sup> , Mingjian Liu <sup>1</sup> , Jie Wu <sup>2</sup> , and N.C. Cheung <sup>1</sup> <sup>1</sup> The Hong Kong Polytechnic University, <sup>2</sup> South China University of Technology	

## PE16: Control of Induction Motor Drive – 2

Wind Star B Room, Saturday, Dec 1, 1:00PM to 2:50PM

Session Co-Chairs: Hoang Le-Huy<sup>1</sup> and Marcelo Simoes<sup>2</sup>, <sup>1</sup>Laval University, Canada <sup>2</sup>Colorado School of Mines, USA

<b>Direct Field-Oriented Control of Induction Motor with Iron-Core Loss Compensation and Robust Parameter Identification</b> .....	1201
Toshihiko Noguchi <sup>1</sup> , Takehide Omura <sup>1</sup> , and Daichi Hiraishi <sup>2</sup>	
<sup>1</sup> Nagaoka University of Technology, <sup>2</sup> Denki Kogyo Co. Ltd. Atsugi Works	
<b>Novel Re-adhesion Control for Train Traction System of the "Shinkansen" with the Estimation of Wheel-to-Rail Adhesive Force</b> .....	1207
Yasushi Matsumoto <sup>1</sup> , Naoya Eguchi <sup>1</sup> , and Atsuo Kawamura <sup>2</sup>	
<sup>1</sup> Fuji Electric Corporate Research and Development Ltd, <sup>2</sup> Yokohama National University	
<b>Optimal Control of Doubly-Fed Full-Controlled Induction Wind Generator With High Efficiency</b> .....	1213
Wilfried Hofmann and Frank Okafor	
TU Chemnitz, Electrical Machines and Drives	
<b>Space Vector Based Constant Frequency Direct Torque Control and Dead Beat Stator Flux Control of AC Machines</b> .....	1219
Anshuman Tripathi, Ashwin Khambadkone, and Sanjib Panda	
National university of Singapore	
<b>Neural Controller Design for Speed Control of an Indirect Field Oriented Induction Machine Drive</b> .....	1225
Abdallah Miloudi <sup>1</sup> and Azeddine Draou <sup>2</sup>	
<sup>1</sup> University center of Saida, <sup>2</sup> University of sciences and technology of Oran à Oran	

## PE17: Analysis and Control of Converters - 2

Wind Star A Room, Saturday, Dec 1, 3:00PM to 4:50PM

Session Co-Chairs: Hoang Le-Huy<sup>1</sup> and Robert Erickson<sup>2</sup>, <sup>1</sup>Laval University, Canada <sup>2</sup>University of Colorado at Boulder, USA

<b>On-Line Impedance Meter To Measure The Impedance Of Distribution Line Using Inverter</b> .....	1230
Keiju Matsui, Nobuyuki Ishigure and Fukashi Ueda	
Chubu University	
<b>An Approximation To Emi Noise Problem To Design An Appropriate Emi Filter Including Double-Lisn</b> .....	1237
Kayhan Gulez <sup>1</sup> , Nobuyoshi Mutoh <sup>1</sup> , Mitsukatsu Ogata <sup>1</sup> , Fumio Harashima <sup>1</sup> , and Kouhei Ohnishi <sup>2</sup>	
<sup>1</sup> Tokyo Metropolitan Institute of Technology, <sup>2</sup> Keio University	
<b>Direct Synchronized Continuous and Discontinuous PWM Based on Algebraic Approach</b> .....	1243
Valentin Oleschuk <sup>1</sup> and Frede Blaabjerg <sup>2</sup>	
<sup>1</sup> Power Engineering Institute of the Academy of Sciences of Moldova, R.O.Moldova,	
<sup>2</sup> Aalborg University	
<b>Design of Phase-shifted Parallel-input/Series-output Dual Inductor-fed Push-pull Converter for High-power Step-up Applications</b> .....	1249
Jeong-il Kang <sup>1</sup> , Chung-Wook Roh <sup>2</sup> , Gun-Woo Moon <sup>1</sup> , and Myung-Joong Youn <sup>1</sup>	
<sup>1</sup> Korea Advanced Institute of Science and Technology, <sup>2</sup> Samsung Electronics Co.	
<b>Limiting Interconverter Zero-Sequence Currents Within 3-Phase Multi-Converter Power Systems - Review And Ultimate Solution</b> .....	1255
Dorin O. Neacsu, Bogdan S. Borowy, and William F. Bonnice	
Satcon Applied Technology, Cambridge, MA	

## PE18: DTC Control of Induction Motor Drives

Wind Star B Room, Saturday, Dec 1, 3:00PM to 4:50PM

Session Co-Chairs: Bimal K. Bose<sup>1</sup> and John McInroy<sup>2</sup>, <sup>1</sup>University of Tennessee, USA <sup>2</sup>University of Wyoming, USA

<b>High Performance Direct Torque Control of Induction Motor Drive Based on Parallel Resonant Inverter</b> .....	1262
Mohamed Azab <sup>1</sup> and A.L. Orille <sup>2</sup>	
<sup>1</sup> Banha High Institute of Technology, Egypt, <sup>2</sup> Politechnical University of Catalonia	
<b>Novel Flux and Torque Control of Induction Motor Drive Using Four Switch Three Phase Inverter</b> .....	1268
Mohamed Azab	
Politechnical University of Catalonia	
<b>A Family of Switching Control Strategies for the Reduction of Torque Ripple on the Direct Torque and Flux Control for Induction Motors</b> .....	1274
Eduardo Galvan <sup>1</sup> , Juanma Carrasco <sup>1</sup> , Romeo Ortega <sup>2</sup> , Gerardo Escobar <sup>3</sup> , and Alex Stankovic <sup>3</sup>	
<sup>1</sup> Universidad de Sevilla, <sup>2</sup> Lss-Supelec, <sup>3</sup> Northeastern University	
<b>Implementation of Direct Torque Control of AC Drive with Synchronized Notched DC Link Voltage</b> .....	1280
Mohamed Azab <sup>1</sup> , A.L. Orille <sup>2</sup>	
<sup>1</sup> Banha High Institute of Technology, Egypt, <sup>2</sup> Politechnical University of Catalonia	
<b>Direct Torque Control Of Induction Machines With Constant Switching Frequency And Improved Stator Flux Estimation</b> .....	1285
Nik Rumzi Nik Idris, Abdul Halim Mohd Yatim, and Naziha Ahmad Azli	
Universiti Teknologi Malaysia	

## PE19: Converter Application in Power System

Wind Star A Room, Sunday, Dec 2, 8:00AM to 9:50AM

Session Co-Chairs: Dorin O. Neacsu<sup>1</sup> and Novica Losic<sup>2</sup>, <sup>1</sup>SatCon Applied Technology, USA <sup>2</sup>Honeywell, Canada

<b>Photovoltaic Energy Processing for Utility Connected System</b> .....	1292
Denizar Cruz Martins and Rogers Demonti	
Power Electronics Institute - Inep	
<b>Distributed Polymer Electrolyte Fuel Cell Generation System with Load Power Restriction Control</b> .....	1297
Akira Takeuchi, Nobuhiko Yamashita, and Toshiaki Yachi	
NTT Telecommunications Energy Laboratories	
<b>Transient Performance of a New-type Hybrid Electric Power Distributed System with Fuel Cell and SMES</b> .....	1303
Ryoichi Nojima, Ichiro Takano and Yoshio Sawada	
Kogakuin University	
<b>Power Sensor-less MPPT Control Scheme Utilizing Power Balance at DC Link – System Design to Ensure Stability and Response</b> .....	1309
Tatsuya Kitano <sup>1</sup> , Mikihiko Matsui <sup>1</sup> , and Dehong Xu <sup>2</sup>	
<sup>1</sup> Tokyo Institute Of Polytechnics, <sup>2</sup> Zhejiang University	

## PE20: Estimation and Identification in Induction Motor Drives

Wind Star B Room, Sunday, Dec 2, 8:00AM to 9:50AM

Session Co-Chairs: Joachim Holtz<sup>1</sup> and Carlo Rossi<sup>2</sup>, <sup>1</sup>University of Wuppertal, Germany <sup>2</sup>Powertrain System Division, Italy

- Rotor Resistance Identification using Artificial Neural Networks for an Indirect Vector Controlled Induction Motor Drive** ..... 1315  
Baburaj Karanayil, M.F Rahman, and C Grantham  
The University of New South Wales
- Parameter Estimation of a Linear Induction Motor with PWM Inverter** ..... 1321  
Gubae Kang, Junha Kim, and Kwanghee Nam  
POSTECH University
- Parameter Estimation Of Induction Motors - A Review and Status Report** ..... 1327  
Mona Raina and Hamid A. Toliyat  
Texas A & M University
- Novel Full-Order Flux Observer Structure for Speed Sensorless Induction Motors**..... 1333  
Marko Hinkkanen and Jorma Luomi  
Helsinki University of Technology
- Modified Integrator for Voltage Model Flux Estimation of Induction Motors** ..... 1339  
Marko Hinkkanen and Jorma Luomi  
Helsinki University of Technology

## PE21: Converter Circuits and Applications

Wind Star A Room, Sunday, Dec 2, 10:00AM to 11:50AM

Session Co-Chairs: Luis Moran<sup>1</sup> and Robert Erickson<sup>2</sup>,

<sup>1</sup>Concepcion University, Chile <sup>2</sup> University of Colorado at Boulder, USA

- A Compact Autotransformer based 12-pulse Rectifier Circuit** ..... 1344  
Girish Kamath<sup>1</sup>, Bruce Runyan<sup>2</sup>, and Richard Wood<sup>1</sup>  
<sup>1</sup>Baldor Electric, <sup>2</sup>Precision, Inc.
- A Novel Three-Phase Diode Rectifier with LC Resonance in Commercial Frequency**..... 1350  
Isamu Yamamoto<sup>1</sup>, Kazumasa Ohtsuka<sup>1</sup>, Keiju Matsui<sup>1</sup>, and Yugo Yao<sup>2</sup>  
<sup>1</sup>Chubu University, <sup>2</sup>Neturen Co, Ltd
- Current Sourced Power Efficient Sustainer Circuit for AC Plasma Display Drive** ..... 1357  
Chung-Wook Roh<sup>1</sup>, Jung-Pil Park<sup>2</sup>, and Myung-Joong Youn<sup>3</sup>  
<sup>1</sup>Samsung Electronics Co., <sup>2</sup>Samsung SDI Co  
<sup>3</sup>Korea Advanced Institute of Science & Technology

## PE22: Applications of Induction Motor Drives

Wind Star B Room, Sunday, Dec 2, 10:00AM to 11:50AM

Session Co-Chairs: AndreaTilli<sup>1</sup> and Marcelo Simoes<sup>2</sup>, <sup>1</sup>Universita' di Bologna, Italy <sup>2</sup>Colorado School of Mines, USA

- The Dynamics of an Isolated Self-Excited Induction Generator Driven by a Wind Turbine** ..... 1364  
Dawit Seyoum, Colin Grantham, and Faz Rahman  
The University of New South Wales
- A Cage Induction Generator Using a Back to Back PWM Converters for Variable Speed Grid Connected Wind Energy System** ..... 1376  
Ruben Peña<sup>1</sup>, Roberto Cardenas<sup>1</sup>, Ramon Blasco-Gimenez<sup>2</sup>, Greg Asher<sup>3</sup>, and Jon Clare<sup>3</sup>  
<sup>1</sup>University of Magallanes, <sup>2</sup>Polytechnic University of Valencia, Spain <sup>3</sup>University of Nottingham
- A Novel Anti-slip Control without Speed Sensor for Electric Railway Vehicles** ..... 1382  
Tomoki Watanabe and Michihiro Yamashita  
Railway Technical Research Institute

**Harmonic Compensation Using Advanced Electric Machines** ..... 1388  
 Mehdi Abolhassani, Hamid Toliyat, and Prasad Enjeti  
 Texas A&M University

**A Sensorless Active Yaw System for Wind Turbines** ..... 1370  
 Felix Farret, Luciano Pfitscher, and Daniel Bernardon  
 Universidade Federal de Santa Maria

**PE23: Robust Control and Estimation of Induction Motor Drives**

Wind Star A Room, Sunday, Dec 2, 1:00PM to 2:50PM

Session Co-Chairs: Istvan Nagy<sup>1</sup> and Karel Jezernik<sup>2</sup>,

<sup>1</sup>Budapest University of Technology and Economics, Hungary <sup>2</sup>University of Maribor, Slovenia

**Robust Full-Order Observer Design with Less Phase Error for Vector Controlled Induction Motor** ..... 1394  
 Masaru Hasgeawa<sup>1</sup>, Shinji Doki<sup>2</sup>, and Shigeru Okuma<sup>3</sup>  
<sup>1</sup>Chubu University, <sup>2</sup>Mie University, <sup>3</sup>Nagoya University

**A Sliding Mode Speed and Rotor Time Constant Observer for Induction Machines**..... 1400  
 Adnan Derdiyok, Zhang Yan, Mustafa Guven, and Vadim Utkin  
 The Ohio State University

**Induction Motor Robust Control: An H<sup>∞</sup> Control Approach with Field Orientation and Input-Output Linearizing** ..... 1406  
 A. Makouf<sup>1,2</sup>, M.E.H. Benbouzid<sup>2</sup>, D. Diallo<sup>2</sup>, and N.E. Bouguechal<sup>1</sup>  
<sup>1</sup>University of Batna, Algeria, <sup>2</sup>University of Amiens

**Speed Control of Induction Motors Using a Nonlinear Auto-Disturbance Rejection Controller**..... 1412  
 Kai Sun<sup>1</sup>, Lipei Huang<sup>1</sup>, and Guang Feng<sup>2</sup>  
<sup>1</sup>Tsinghua University, <sup>2</sup>Queens University

**MRAS-based Speed Sensorless Control for Induction Motor Drives Using Instantaneous Reactive Power** ..... 1417  
 Cao-Minh Ta, Toshiyuki Uchida, and Yoichi Hori  
 University of Tokyo

**PE24: Synchronous Machines and Drives**

Wind Star B Room, Sunday, Dec 2, 1:00PM to 2:50PM

Session Co-Chairs: Ramu Krishnan<sup>1</sup> and Norbert C. Cheung<sup>2</sup>,

<sup>1</sup>Virginia Polytechnic Institute, USA <sup>2</sup>Hong Kong Polytechnic University, Hong Kong

**A New Approach for Analysis Modeling and Simulation of Brushless Multiphase Machines** ..... 1423  
 Nilson Franceschetti<sup>1</sup> and Marcelo Simoes<sup>2</sup>  
<sup>1</sup>University of Sao Paulo <sup>2</sup>Colorado School of Mines

**Torque Quality and Comparison of Internal and External Rotor Axial Flux Surface-Magnet Disc Machines** ..... 1428  
 Metin Aydin<sup>1</sup>, Surong Huang<sup>2</sup>, and Thomas Lipo<sup>1</sup>  
<sup>1</sup>University of Wisconsin-Madison, <sup>2</sup>Shanghai University

**Novel Rotor Position Extraction based on Carrier Frequency Component Method using Two Reference-frames for IPM drives** ..... 1435  
 Mengesha Mamo<sup>1</sup>, Kozo Ide<sup>1</sup>, Mitsujiro Sawamura<sup>1</sup>, and Jun Oyama<sup>2</sup>  
<sup>1</sup>Yaskawa Electric Corporation, <sup>2</sup>Nagasaki University

**Input Current Shaping in BLDC Motor Drives Using a New Converter Topology** ..... 1441  
 Tilak Gopalarathnam and Hamid Toliyat  
 Texas A&M University

<b>Stability Analysis of Permanent Magnet Synchronous Motors for Railway Vehicle Traction in the Sudden Line Voltage Change</b> .....	1445
Keiichiro Kondo and Koichi Matsuoka Railway Technical Research Institute	

**PE25: Synchronous Machine Drives**

Wind Star A Room, Sunday, Dec 2, 3:00PM to 4:50PM

Session Co-Chairs: Istvan Nagy<sup>1</sup> and Peter Hauge Madsen<sup>2</sup>,

<sup>1</sup>Technical University of Technology and Economics, Hungary <sup>2</sup>Riso National Laboratory, Denmark

<b>Implementation of a Matrix Converter PMSM Position Control System</b> .....	1451
Tian-Hua Liu and Der-Fa Chen National Taiwan University of Science and Technology	

<b>An Anti Oscillation Strategy for the Regenerative Braking Control of Permanent Magnet Synchronous Motor with Insufficient Load Power Consumption</b> .....	1457
Feri Yusivar <sup>1</sup> , Kenji Uchida <sup>1</sup> , Takahiro Kihara <sup>1</sup> , Shinji Wakao <sup>1</sup> , Keiichiro Kondo <sup>2</sup> , and Koichi Matsuoka <sup>2</sup> <sup>1</sup> Waseda University, <sup>2</sup> Japan Railway RTRI	

<b>Development and Testing of the Torque Control for the Permanent-Magnet Synchronous Motor</b> .....	1463
Hideo Nakai <sup>1</sup> , Hiroki Ohtani <sup>1</sup> , Eiji Satoh <sup>2</sup> , and Yukio Inaguma <sup>1</sup> <sup>1</sup> Toyota Central R&D Labs, Inc., <sup>2</sup> Toyota Motor Corporation	

<b>Mover Structure and Thrust Characteristic of Moving-Magnet-type Surface Motor</b> .....	1469
Junichi Tsuchiya and Gunji Kimura Tokyo Metropolitan University	

<b>A High-Performance Vector Controlled Interior PM Synchronous Motor Drive with Extended Speed Range Capability</b> .....	1475
Christos Mademlis <sup>1</sup> and Vassilios Agelidis <sup>2</sup> Aristotle University of Thessaloniki <sup>1</sup> , University of Glasgow <sup>2</sup>	

**PE26: Variable Reluctance Motor Drives**

Wind Star B Room, Sunday, Dec 2, 3:00PM to 4:50PM

Session Co-Chairs: Silverio Bolognani<sup>1</sup> and Fahimi Babak<sup>2</sup>, <sup>1</sup>University of Padova, Italy, <sup>2</sup>Electro Standards Laboratories, USA

<b>The Parallel Drive System of the Double Switched Reluctance Motors for Locomotive Traction Application</b> .....	1483
Chen Hao and Xie Guilin China University of Mining & Technology	

<b>A Novel Single-Phase Switched Reluctance Motor Drive System</b> .....	1488
R. Krishnan <sup>1</sup> , Amanda Staley <sup>1</sup> , and K. Sitapati <sup>2</sup> <sup>1</sup> Virginia Polytechnic Institute and State University, <sup>2</sup> Custom Motor Solutions Group, Kollmorgen	

<b>Sensorless Implementation of an SCR-based Commutatorless Series Motor Drive</b> .....	1494
Kaushik Mukherjee <sup>1</sup> , Sabyasachi SenGupta <sup>1</sup> , Tapas Bhattacharya <sup>1</sup> , Sailendra Bhadra <sup>1</sup> , and Ajit Chattopadhyay <sup>2</sup> <sup>1</sup> Indian Institute of Technology, Kharagpur, <sup>2</sup> Bengal Engineering College	

<b>Sensorless Operation of SRM Drives: R &amp; D Status</b> .....	1498
R. Krishnan The Bradley Dept. of ECE, Virginia Tech, Blacksburg, VA	

**Vector Control of Hybrid Stepping Motor Position Servo System Using Neural Network Control.....** 1504  
 Kefsi Laid, Xu Dianguo and Shi Jingzhuo  
 Harbin Institute of Technology

**ISPE: Interactive Session on Power Electronics**

Friday, Nov 30, 5:00PM to 5:50PM

**An Over Current Protection Scheme for Series Active Compensators.....** 1509  
 Beom-Seok Chae<sup>1</sup>, Woo-Cheol Lee<sup>1</sup>, Taeck-Kie Lee<sup>2</sup>, and Dong-Seok Hyun<sup>1</sup>  
<sup>1</sup>Hanyang University, <sup>2</sup>Hankyong National University

**A New Family of Matrix Converters .....** 1515  
 Robert Erickson and Osama Al-Naseem  
 University of Colorado, Boulder

**A New Current Control Algorithm for Torque Ripple Reduction of BLDC Motors .....** 1521  
 Tae-Sung Kim, Sung-Chan Ahn, and Dong-Seok Hyun  
 Hanyang University

**Generation of low-EMI PWM Patterns for Induction Motor Drives With Chaotic Maps .....** 1527  
 Alberto Bellini<sup>1</sup>, Giovanni Franceschini<sup>1</sup>, Riccardo Rovatti<sup>2</sup>, Gianluca Setti<sup>3</sup>, and Carla Tassoni<sup>1</sup>  
<sup>1</sup>University of Parma, <sup>2</sup>University of Bologna, <sup>3</sup>University of Ferrara

**Discrete Time Compensation Of Switching Events For Accurate Real-Time Simulation Of Power Systems.....** 1533  
 Christian Dufour and Jean Belanger  
 OPAL-RT Technologies inc.

**Operation of Unified Constant-frequency Integration Controlled Three-phase Active Power Filter in Unbalanced System.....** 1539  
 Taotao Jin, Chongming Qiao, and Keyue Smedley  
 UCI

<b>TUT01: J. Holtz "Sensorless Speed and Position Control of Induction Motors"</b> .....	1547
Grand Mesa F Room, Friday, Nov 30, 8:00AM to 11:50AM	
Holtz Joachim	
University of Wuppertal, Germany	
<b>TUT02: Efe &amp; Kaynak "Variable Structure Systems Theory Based Training Strategies for Computationally Intelligent Systems"</b> .....	1563
Wind River B Room, Friday, Nov 30, 10:00AM to 11:50AM	
M. Onder Efe <sup>1</sup> and Okyay Kaynak <sup>2</sup>	
<sup>1</sup> Carnegie Mellon University, <sup>2</sup> Bogazici University, Turkey	
<b>TUT03: Design of Adjustable Speed Switched Reluctance Motor Drives</b> .....	1577
Grand Mesa F Room, Thursday, Nov 29, 2:00PM to 2:50PM	
Fahimi Babak	
Electro Standards Laboratories	
<b>TUT07: Mine Detection and Sensing Technologies-New Development Potentials in the Context of Humanitarian Demeaning</b> .....	1612
Grand Mesa F Room, Thursday, Nov 29, 3:00PM to 3:50PM	
Maki Habib	
Monash University, Malaysia	
<b>TUT05: Network-Based Control Systems</b> .....	1593
Grand Mesa F Room, Thursday, Nov 29, 4:00PM to 4:50PM	
Mo-Yuen Chow and Yodyium Tipsuwan	
North Carolina State University, USA	
<b>TUT06: Modeling and Simulation of Electrical Drives using MATLAB/Simulink and Power System Blockset</b> .....	1603
Grand Mesa F Room, Thursday, Nov 29, 5:00PM to 5:50PM	
Le-Huy Hoang	
Laval University	
<b>TUT04: Space Vector Modulation</b> .....	1583
Grand Mesa F Room, Thursday, Nov 29, 6:00PM to 6:50PM	
Neacsu Dorin	
Satcon Technology Center, USA	
<b>TUT08: Internet Technology as a Tool for Solving Engineering Problems</b> .....	1622
Grand Mesa F Room, Sanday, Dec 2, 8:00AM to 8:50AM	
Aleksander Malinowski <sup>1</sup> and Bogdan Wilamowski <sup>2</sup>	
<sup>1</sup> Bradley University, USA, <sup>2</sup> University of Idaho at Boise, USA	
<b>TUT09: Artificial Neural Network Applications in Power Electronics</b> .....	1631
Grand Mesa F Room, Sanday, Dec 2, 9:00AM to 9:50AM	
Bimal K. Bose	
University of Tennessee, USA	
<b>TUT10: Factory Monitoring and Control Using the Internet</b> .....	1639
Grand Mesa F Room, Sanday, Dec 2, 10:00AM to 10:50AM	
Alfred Weaver	
University of Virginia, USA	
<b>TUT11: New Trends in Information Aggregation</b> .....	1646
Grand Mesa F Room, Sanday, Dec 2, 11:00AM to 11:50AM	
Imre J. Rudas	
Budapest Polytechnic, Hungary	

### SS01: Special Session on PM Motor Control

Mesa Verde B Room, Thursday, Nov 29, 1:00PM to 2:50PM

Session Co-Chairs: Muneaki Ishida<sup>1</sup> and Silverio Bolognani<sup>2</sup>, <sup>1</sup>Mie University, Japan <sup>2</sup>University of Padova, Italy

- A Novel Sensorless Control Drive for an Interior Permanent Magnet Motor** ..... 1655  
S. Saha, T. Tazawa, T. Iijima, K. Narazaki, H. Murakami, and Y. Honda  
Matsushita Electric Industrial Co. Ltd. (MEI)
- Fuzzy PI Controller Tuning for a Linear Permanent Magnet Synchronous Motor Drive** ..... 1661  
Shih-Chang Hsu, Chio-Hao Liu, Chang-Huan Liu, and Nai-Jian Wang Liu  
National Taiwan University of Science and Technology
- Sensorless Control of an Interior Permanent Magnet Synchronous Motor on the Rotating Coordinate using an Extended Electromotive Force** ..... 1667  
Shinji Ichikawa<sup>1</sup>, Zhiqian Chen<sup>1</sup>, Mutuwo Tomita<sup>2</sup>, Shinji Doki<sup>3</sup>, and Shigeru Okuma<sup>1</sup>  
<sup>1</sup>Nagoya University, <sup>2</sup>Gifu National College of Technology, <sup>3</sup>Mie University
- Vibration Suppression Control Method for PMSM Utilizing Repetitive Control with Auto-Tuning Function and Fourier Transform** ..... 1673  
Satomi Hattori, Muneaki Ishida, and Takamasa Hori  
Mie University
- Position and Speed Sensorless Control for PMSM Drive Using Direct Position Error Estimation**..... 1680  
Kiyoshi Sakamoto, Yoshitaka Iwaji, Tsunehiro Endo, and Yuhachi Takakura  
Hitachi Tochigi Technology Co., Ltd

### SS02: Special Session on Advanced Motion Control 1

Mesa Verde B Room, Thursday, Nov 29, 3:00PM to 4:50PM

Session Co-Chairs: Kiyoshi Ohishi and Tatsuya Suzuki, Nagoya University, Japan

- Switching of H<sup>∞</sup> Controller under Existence of Constraints on State Variables** ..... 1686  
Hayato Komatsu, Tatsuya Suzuki, and Shigeru Okuma  
Nagoya University
- Efficiency Maximization of Induction Motor Drives for Electric Vehicles Based on Actual Measurement of Input Power** ..... 1692  
Cao-Minh Ta, Chandan Chakraborty, and Yoichi Hori  
University of Tokyo, Japan
- Detection of Abnormal Movement of Industrial Robots Using Image Sequence**..... 1698  
Hirokazu Seki and Yoichi Hori  
University of Tokyo
- Suppression of Limit Cycle and Improvement of Robust Performance in Two-Mass Resonant Systems with Nonlinearity**..... 1704  
Satoshi Komada, Kouichirou Iyama, Kazuhiro Yubai, and Takamasa Hori  
MIE University

### SS03: Special Session on Advanced Motion Control 2

Mesa Verde B Room, Thursday, Nov 29, 5:00PM to 6:50PM

Session Co-Chairs: Kiyoshi Ohishi and Tatsuya Suzuki, Nagoya University, Japan

- Robust Feedforward Tracking Servo System for an Optical Disk Recording System** ..... 1710  
Kiyoshi Ohishi<sup>1</sup>, Kenji Kudo<sup>1</sup>, Yoshinori Hayakawa<sup>1</sup>, Hitoshi Yanagisawa<sup>2</sup>, Daiichi Koide<sup>2</sup>,  
and Haruki Tokumaru  
<sup>1</sup>Nagaoka University of Technology, <sup>2</sup>NHK Science and Technical Research Laboratories

<b>GMDH-Based Modeling and Compensation for Nonlinear Friction in Table Drive Systems.....</b>	1716
Makoto Iwasaki, Hiroto Takei, and Nobuyuki Matsui Nagoya Institute of Technology	
<b>Sampling Period in Discrete Time Acceleration Control.....</b>	1722
Kunimatsu Hashimoto <sup>1</sup> , Ivan Godler <sup>2</sup> , and Tamotsu Ninomiya <sup>1</sup> <sup>1</sup> Kyushu University, Japan, <sup>2</sup> Kitakyushu University	
<b>An Approach to Stable Walking on Unknown Slippery Floor for Biped Robot.....</b>	1728
Hiroki Yamamoto and Kouhei Ohnishi Keio University, Japan	

**SS04: Special Session on Current Trends in Electronic Education 1**

Mesa Verde B Room, Friday, Nov 30, 8:00AM to 9:50AM

Session Co-Chairs: Ahmad Ibrahim<sup>1</sup> and Jang Myung Lee<sup>2</sup>,

<sup>1</sup>DeVry Institute of Technology, Canada <sup>2</sup>Pusan National University, Korea

<b>Identification of Nonlinear Dynamic Systems Using a Rapid Neural Network.....</b>	1734
Refaat Ahmed Helwan University	
<b>Interdisciplinary Integration in Engineering Education .....</b>	1740
Alexander A. Berezin McMaster University	
<b>A Road Map for an Integrated Undergraduate Industrial Electronics Design Program .....</b>	1746
Erol Inelmen Bogazici University	
<b>Suggestions to Further Encourage the Use of Internet in Engineering Education .....</b>	1750
Erol Inelmen and Kivanc Inelmen Bogazici University	
<b>Retention of Engineering and Technology Undergraduates.....</b>	1754
Ahmad Ibrahim <sup>1</sup> and Mohamed Brihoum <sup>2</sup> <sup>1</sup> DeVry Institute of Technology-Canada, <sup>2</sup> DeVry Institute of Technology-USA	

**SS05: Special Session on Current Trends in Electronic Education 2**

Mesa Verde B Room, Friday, Nov 30, 10:00AM to 11:50AM

Session Co-Chairs: Ahmad Ibrahim<sup>1</sup> and Marian P. Kazmierkowski<sup>2</sup>,

<sup>1</sup>DeVry Institute of Technology, Canada <sup>2</sup>Warsaw University of Technology, Poland

<b>Network Home Automation Projects.....</b>	1758
Aleksander Malinowski Bradley University	
<b>Implementing ABET Outcomes, Assessment and Remedial Techniques in a Basic Circuits Course.....</b>	1763
Lawrence Huelsman and Robin Strickland University of Arizona	
<b>Proposal of the Web-based Training System for the Experiment of the Digital Circuit.....</b>	1766
Hiroshi Izumi <sup>1</sup> , Hideki Murakoshi <sup>1</sup> , Hisanao Mori <sup>1</sup> , Kazumi Sakamaki <sup>1</sup> , Yasuo Hatano <sup>2</sup> , and Takashi Ugajin <sup>2</sup> <sup>1</sup> Tokyo Metropolitan Industrial Technology Research Institute, <sup>2</sup> Andor System Support Co., Ltd	
<b>Senior Design Projects: A Design Example from Concept to Finished Product.....</b>	1771
Brett Marshall, Michael Parker and Thomas Stewart Bradley University	

<b>Application of Mathematical Software in Modeling and Understanding of Traffic Simulation Models</b> .....	1775
Ghulam H. Bham and Rahim Benekohal	
University of Illinois at Urbana-Champaign, USA	

<b>A Remotely Accessed Micro Controller Laboratory</b> .....	1781
Donald R. Schertz	
Bradley University	

**SS06: Special Session on Network Based Technologies and Applications 1**

Wind Star B Room, Friday, Nov 30, 2:00PM to 3:50PM

Session Co-Chairs: Mo-Yuen Chow<sup>1</sup>, Aleksander Malinowski<sup>2</sup>, and Alfred C. Weaver<sup>3</sup>,

<sup>1</sup>North Carolina State University, USA <sup>2</sup>Bradley University, USA <sup>3</sup>University of Virginia, USA

<b>Internet-based Factory Monitoring</b> .....	1784
Alfred Weaver	
University of Virginia	

<b>Multi-Tiered Internet Computing using Java Technologies</b> .....	1789
Jiang Liu	
Bradley University	

<b>Network-Based Controller Adaptation based on QoS Negotiation and Deterioration</b> .....	1794
Yodyium Tipsuwan and Mo-Yuen Chow	
North Carolina State University	

<b>A Fault Management Protocol for TTP/C</b> .....	1800
Juan Pimentel <sup>1</sup> and Teodoro Sacristan <sup>2</sup>	
<sup>1</sup> Kettering University, <sup>2</sup> Universidad Politecnica de Madrid	

**SS07: Special Session on Network Based Technologies and Applications 2**

Wind Star B Room, Friday, Nov 30, 4:00PM to 5:50PM

Session Co-Chairs: Mo-Yuen Chow<sup>1</sup>, Aleksander Malinowski<sup>2</sup>, and Alfred C. Weaver<sup>3</sup>,

<sup>1</sup>North Carolina State University, USA <sup>2</sup>Bradley University, USA <sup>3</sup>University of Virginia, USA

<b>Multicast Distribution and Control for Streaming Multimedia</b> .....	1806
James Van Dyke and Alfred C. Weaver	
University of Virginia	

<b>A Scalable Web-Based Real-Time Information Distribution Service for Industrial Applications</b> .....	1810
Seejo Sebastine, Kyoung-Don Kang, Tarek Abdelzaher, and Sang Son	
University of Virginia	

<b>Tiered Control Networks</b> .....	1816
Richard Wall and Bradley King	
University of Idaho	

<b>Remote Fuzzy Logic Control for Networked Control System</b> .....	1822
Suk Lee <sup>1</sup> , Sang Ho Lee <sup>2</sup> , and Kyung Chang Lee <sup>1</sup>	
<sup>1</sup> Pusan National University, <sup>2</sup> Agency for Defense Development	

**SS08: Special Session on Software Engineering 1**

Mesa Verde B Room, Saturday, Dec 1, 10:00AM to 11:50AM

Session Co-Chairs: Jim Coplien<sup>1</sup>, Elke Pulvermueller<sup>2</sup>, and Andreas Speck<sup>3</sup>,

<sup>1</sup>Bell Lab. USA, <sup>2</sup>Univ. Karlsruhe, Germany, and <sup>3</sup>Univ. Tuebingen, Germany

<b>Specification in a Large Industry Consortium - The MOST Approach</b> .....	1828
Thilo Gaul, Welf Löwe, and Markus Noga	
Universität Karlsruhe	

<b>Component-Based Software Development</b> .....	1834
Luiz Capretz, Miriam Capretz, and Dahai Li University of Western Ontario	
<b>Reference Implementation of the Internet-supported Home Security System</b> .....	1838
Wojciech Moscibrodzki <sup>1</sup> , Slawomir Kwiatkowski <sup>1</sup> , and Aleksander Malinowski <sup>3</sup> <sup>1</sup> Technical University of Gdansk, <sup>2</sup> Bradley University	
<b>Components and Data-Flow Applied to the Integration of Wen Services</b> .....	2204
Paolo Predonzani, Alberto Sillitti, Tullio Vernazza DIST – Universita di Genova	

### SS09: Special Session on Software Engineering 2

Mesa Verde B Room, Saturday, Dec 1, 1:00PM to 2:50PM

Session Co-Chairs: Jim Coplien<sup>1</sup>, Elke Pulvermueller<sup>2</sup>, and Andreas Speck<sup>3</sup>,

<sup>1</sup>Bell Lab. USA, <sup>2</sup>Univ. Karlsruhe, Germany, and <sup>3</sup>Univ. Tuebingen, Germany

<b>Network-Based Controlled DC Motor with Fuzzy Compensation</b> .....	1844
Naif Almutairi, Mo-Yuen Chow, and Yodyium Tipsuwan North Carolina State University	
<b>A Modified Development Process for Distributed Systems</b> .....	1850
Javier Andrade, Juan Ares, Rafael Garcia, and Santiago Rodriguez A Corunna University	
<b>Versioning in Software Engineering</b> .....	1856
Andreas Speck <sup>1</sup> and Elke Pulvermueller <sup>2</sup> <sup>1</sup> Intershop Research, Jena, <sup>2</sup> IPD, Universitaet Karlsruhe	
<b>Unsupervised Pattern Clustering for Data Mining</b> .....	1862
Katarzyna Wilamowska <sup>1</sup> and Milos Manic <sup>2</sup> <sup>1</sup> University of Wyoming, <sup>2</sup> University of Idaho	
<b>Papers Collection and Evaluation Through the Internet</b> .....	1868
Aleksander Malinowski <sup>1</sup> and Bogdan Wilamowski <sup>2</sup> <sup>1</sup> Bradley University, <sup>2</sup> University of Idaho at Boise	

### SS10: Special Session on Low Power Electronics

Grand Mesa F Room, Sunday, Dec 2, 1:00PM to 2:50PM

Session Co-Chairs: Vitit Kantabutra<sup>1</sup> and Marian P. Kazmierkowski<sup>2</sup>,

<sup>1</sup>Idaho State University, USA <sup>2</sup>Warsaw University of Technology, Poland

<b>Switching Regulator with Dynamically Adjustable Supply Voltage for Low Power VLSI</b> .....	1874
Sandeep Dhar and Dragan Maksimovic University Of Colorado	
<b>Achieving Power Efficiency through Minimum Cycle Time in Digital Signal Processor Design</b> .....	1880
Mauro Olivier La Sapienza University of Rome	
<b>VLSI implementation of Cross-coupled MOS Resistor Circuits</b> .....	1886
Phuoc Tran and Bogdan Wilamowski University of Idaho	
<b>A Low Power DSP Core for an Embedded MP3 Decoder Core</b> .....	1892
Dishi Lai, Quan Lin, Sizhong Chen, and Martin Margala University of Rochester	

## SS11: Special Session on Real Time Simulation of Transportation Systems

Mesa Verde B Room, Sunday, Dec 2, 10:00AM to 11:50AM

Session Co-Chairs: Brian Johnson and Michael Kyte, University of Idaho, USA

- Connecting SCOOT to CORSIM: Real-Time Signal Optimization Simulation** ..... 1898  
Joseph Perrin<sup>1</sup>, Peter Martin<sup>1</sup>, and Blake Hansen<sup>2</sup>  
<sup>1</sup>University of Utah Traffic Laboratory, <sup>2</sup>Transcore, Inc.
- A Laboratory-Based Course on Real-Time Traffic Signal Control** ..... 1904  
Andrew Nichols<sup>1</sup>, Darcy Bullock<sup>1</sup>, and Michael Kyte<sup>2</sup>  
<sup>1</sup>Purdue University, <sup>2</sup>University of Idaho
- Psuedo Real-Time Evaluation of Adaptive Traffic Control Strategies Using Hardware-in-Loop Simulation** ..... 1910  
Eil Kwon<sup>1</sup>, Sangho Kim<sup>1</sup>, and Taek Mu Kwon<sup>2</sup>  
<sup>1</sup>University of Minnesota, <sup>2</sup>University of Minnesota Duluth
- Hardware and Software Considerations for Implementing Hardware in the Loop Traffic Simulation** ..... 1915  
Richard Wells, John Fisher, Ying Zhou, Brian Johnson, and Michael Kyte  
University of Idaho
- Using Hardware-in-the-Loop Traffic Simulation to Evaluate Traffic Signal Controller Features** ..... 1920  
Roelof Engelbrecht  
Texas Transportation Institute

## SS12: Special Session on Soft Computing Based Image Processing

Wind River A Room, Saturday, Dec 1, 1:00PM to 2:50PM

Session Co-Chairs: Yasuhiro Ota<sup>1</sup> and John McInroy<sup>2</sup>, <sup>1</sup>MINOLTA Co., Ltd., Japan <sup>2</sup>University of Wyoming, USA

- Visual Motion Detection with Hand-Eye Manipulator Using Statistic Moments Classifiers and Fuzzy Logic Approach-Study, Application, and Comparison** ..... 1926  
Tito G. Amaral<sup>2</sup>, Manuel M. Crisóstomo<sup>1</sup>, Vitor F. Pires<sup>2</sup>, and Aníbal T. Almeida<sup>1</sup>  
<sup>1</sup>Instituto de Sistemas e Robótica - Pólo de Coimbra, <sup>2</sup>Escola Superior de Tecnologia de Setúbal / IPS
- Three Dimensional Measurement Using Color Image and Movable CCD System**..... 1932  
Toshihito Egami<sup>1</sup>, Toshiyuki Kashiwagi<sup>2</sup>, Shunichiro Oe<sup>1</sup>, and Kenji Terada<sup>1</sup>  
<sup>1</sup>Tokushima University, <sup>2</sup>Tokushima Prefectural Industrial Technology Center
- Detecting of One's Eye from Facial Image by using Genetic Algorithm** ..... 1937  
Hideaki Tani<sup>1</sup>, Kenji Terada<sup>1</sup>, Shunichi Oe<sup>1</sup>, and Junichi Yamaguchi<sup>2</sup>  
<sup>1</sup>Tokushima University, <sup>2</sup>Kagawa University
- A Study on Automatic Filter Construction for Feature Extraction with Feature Reconstruction**..... 1941  
Yoshikazu Yano, Tomonori Hashiyama, and Shigeru Okuma  
Nagoya University

## SS13: Special Session on Renewable Energy Systems 1

Mesa Verde B Room, Saturday, Dec 1, 3:00PM to 4:50PM

Session Co-Chairs: Jan T. Bialasiewicz<sup>1</sup> and Ed Muljadi<sup>2</sup>,

<sup>1</sup>University of Colorado at Denver, USA, <sup>2</sup>U.S. National Renewable Energy Laboratory, USA

- On The Suitability of Switched Reluctance Motor Drives for 42 Volts Super High Speed Operation: Application to Automotive Fuel Cells** ..... 1947  
Babak Fahimi<sup>1</sup>, Yimin Gao<sup>2</sup>, and Mehrdad Ehsani<sup>2</sup>  
<sup>1</sup>Electro Standards Laboratories, <sup>2</sup>Texas A&M University

<b>Resonant Ac Link System Converter For Fuel Cell Grid Interface</b> .....	1953
Marcelo Simoes, Jared Severson, P.K. Sen, and John Palmer Colorado School of Mines	
<b>Wind Farm Modeling for Power Quality</b> .....	1959
Anca Daniela Hansen <sup>1</sup> , Poul Sørensen <sup>1</sup> , Lorand Janosi <sup>2</sup> , and John Bech <sup>3</sup> <sup>1</sup> Risø National Laboratory, <sup>2</sup> Aalborg University, <sup>3</sup> DanControl Engineering A/S	
<b>Photovoltaic Energy Processing for Utility Connected System</b> .....	1965
Denizar Cruz Martins and Rogers Demonti Power Electronics Institute - Inep	
<b>Industrial Implementation of a Back-to-Back Intertie Using Two Standard Drives - A Retrofit Solution to Obtain a Clean Utility Interface</b> .....	1970
Ajith Wijenayake <sup>1</sup> and Madhav Manjrekar <sup>2</sup> <sup>1</sup> Beacon Power Corporation, <sup>2</sup> ABB Automation Inc.	

**SS14: Special Session on Renewable Energy Systems 2**

Mesa Verde B Room, Sunday, Dec 2, 8:00AM to 9:50AM

Session Co-Chairs: Jan T. Bialasiewicz<sup>1</sup> and Ed Muljadi<sup>2</sup>,

<sup>1</sup>University of Colorado at Denver, USA <sup>2</sup>U.S. National Renewable Energy Laboratory, USA

<b>A Simple Single-Phase Low Frequency Communication Inverter for Renewables</b> .....	1976
Geomar Martins <sup>1</sup> , José Pomilio <sup>2</sup> , and Simone Buso <sup>3</sup> <sup>1</sup> Federal University of Santa Maria, <sup>2</sup> University of Campinas, <sup>3</sup> University of Padova	
<b>Electronically Controlled Bi-Directional Connection of Induction Generator With a Single-Phase Grid</b> .....	1982
Ricardo Machado <sup>1</sup> , Enes Marra <sup>2</sup> , and José Pomilio <sup>1</sup> <sup>1</sup> University of Campinas, <sup>2</sup> Federal University of Goias	
<b>RPM-Sim – Based Analysis of Power Converter Applications in Renewable Energy Systems</b> .....	1988
Jan T. Bialasiewicz <sup>1</sup> , Eduard Muljadi <sup>2</sup> , and R. Gerald Nix <sup>2</sup> <sup>1</sup> University of Colorado at Denver, <sup>2</sup> National Renewable Energy Laboratory	
<b>A Predictive Control Scheme for DC Voltage and AC Current in Grid-connected Photovoltaic Inverters with Minimum DC Link Capacitance</b> .....	1994
Andrew Kotsopoulos, Jorge Duarte, and Marcel Hendrix Technical University of Eindhoven	
<b>Generators and Power Electronics Technology for Wind Turbines</b> .....	2000
Lars Henrik Hansen <sup>1</sup> , Frede Blaabjerg <sup>2</sup> , Hans Christian Christensen <sup>3</sup> , Ulf Lindhard <sup>4</sup> Kim Eskildsen <sup>4</sup> , and Peter Hauge Madsen <sup>1</sup> <sup>1</sup> RISO, <sup>2</sup> Aalborg University, <sup>3</sup> ABB-Denmark, <sup>4</sup> Siemens-Denmark	

**SS15: Special Session on Survivable Systems and Networks**

Mesa Verde B Room, Sunday, Dec 2, 1:00PM to 2:50PM

Session Co-Chairs: Axel Krings and Azad Azadmanesh, University of Idaho, USA

<b>A Scalable VP Restoration System for Reliable Internet Configuration</b> .....	2006
Won-Kyu Hong Telecommunications Network Lab., R&D Group, Korea Telecom	
<b>Replacement of Components in Public Key Infrastructures</b> .....	2012
Michael Hartmann <sup>1</sup> and Sönke Maseberg <sup>2</sup> <sup>1</sup> Technical University of Darmstadt, <sup>2</sup> Fraunhofer-Institute for Secure Telecooperation	

**Towards The Attack Signatures' Comparison In Survivable Computer Networks** ..... 2017  
 Milos Manic and Bogdan Wilamowski,  
 University of Idaho

**Global Convergence in Partially Fully Connected Networks (PFCN) with Limited Relays** ..... 2022  
 Azad Azadmanesh and Harinder Bajwa  
 University of Nebraska at Omaha

**SS16: Special Session on Application of Knowledge-Based Systems in Power and Control**

Wind River B Room, Friday, Nov 30, 2:00PM to 3:50PM

Session Co-Chairs: M. Farooq<sup>1</sup> and Gerhard P. Hancke<sup>2</sup>,

<sup>1</sup>Royal Military College of Canada, Canada <sup>2</sup>University of Pretoria, South Africa

**Application of Variable Structure Fuzzy Logic Controller for DC-DC Converters**..... 2026  
 Yigang Shi and P.C Sen  
 Queen's University

**Single-Phase Shunt Active Power Filter with Adaptive Neural Network Method for Determining Compensating Current** ..... 2032  
 M. Rukonuzzaman and Mutsuo Nakaoka  
 Yamaguchi University

**Fuzzy Model Reference Learning Control of Induction Motor via Genetic Algorithm**..... 2038  
 Ahmed El Dessouki and Mohamed Tarbouchi  
 Royal Military College OF Canada

**Application of Fuzzy Logic in Engineering Problems** ..... 2044  
 Ahmed Gad and M.Farooq  
 Royal Military College of Canada

**Integration of a Fuzzy Guidance-Control System for a Command Interceptor Against Hypersonic Target**..... 2050  
 Yehia El Halwagy and Mohammed Tarbouchi  
 Royal Military College of Canada

**SS17: Special Session on Technical Activities**

Mesa Verde B Room, Friday, Nov 29, 5:00PM to 6:50PM

Session Co-Chairs: Hideki Hashimoto, University of Tokyo

**A Survey of Industrial Information Technology** ..... 2056  
 Alfred C. Weaver  
 University of Virginia

**Sensors and Actuators for Intelligent Mechatronic Systems** ..... 2062  
 Ren C. Luo  
 National Chung Cheng University

**Report of Technical Activities - Computer and Control Systems Technical Committee --**..... 2066  
 Hideki Hashimoto  
 University of Tokyo

**ISCI: Interactive Session on Computational Intelligence**

Friday, Nov 30, 4:00PM to 4:50PM

**A Robust Hybrid Current Control for Permanent Magnet Synchronous Motor Drive** ..... 2068  
 M. Kadjoudj<sup>1</sup>, M.E.H. Benbouzid<sup>2</sup>, R. Abdessemed<sup>1</sup>, and C. Ghennai<sup>1</sup>  
 University of Batna, <sup>2</sup>University of Amiens

<b>Exception-Based Reinforcement Learning .....</b>	<b>2074</b>
Pascal Garcia IRISA / INSA-Département informatique Rennes	
<b>Mobile Telephony RF Mapping Using Fuzzy-CMAC Neural Networks.....</b>	<b>2080</b>
Paulo E. M. Almeida <sup>1</sup> , Paulo T. Pereira <sup>2</sup> , and M. Godoy Simões <sup>3</sup> DPPG / CEFET - MG, <sup>2</sup> Telemig Celular, <sup>3</sup> Colorado School of Mines	
<b>Dual Arm Movement Control by a Neurobotics Model .....</b>	<b>2086</b>
Seddik Khemaissia Riyadh College of Technology	
<b>Designing Fuzzy Logic Controllers for DC Servomotors Supported by Fuzzy Logic Control Development Environment.....</b>	<b>2093</b>
Maki Habib Monash University	
<b>Identification and Control of Resonant Switch Mode Converters Using Neural Networks .....</b>	<b>2099</b>
Mona Eskander <sup>1</sup> and Baha Bahawodin <sup>2</sup> <sup>1</sup> Electronic Research Institute, <sup>2</sup> Brighton University	
<b>Constraint-Based Distributed Intelligent Conceptual Design Environment and System Model.....</b>	<b>2105</b>
Yurong Xu, Shouqian Sun, and Yunhe Pan Zhejiang University	
<b>Fuzzy Logic Speed Control of an Indirect Field-Oriented Induction Machine Drive .....</b>	<b>2111</b>
Azeddine Draou <sup>1</sup> and Yahya Miloud <sup>2</sup> <sup>1</sup> University of Science and Technology of Oran, <sup>2</sup> University of Saida	

## **ISET: Interactive Session on Emerging Technologies**

Friday, Nov 30, 2:00PM to 2:50PM

<b>A Low-energy Compact Electron Beam Irradiator for Core-loss Reduction of Silicon Steel .....</b>	<b>2117</b>
Min Kim <sup>1</sup> , Jeong-Phil Yoon <sup>1</sup> ,Gi-Je Lee <sup>1</sup> , In-Su Cha <sup>1</sup> , Sung-Oh Cho <sup>2</sup> , Byeong-Cheol Lee <sup>2</sup> , and Young-Uk Jeong <sup>2</sup> <sup>1</sup> Dong-shin University, <sup>2</sup> Korea Atomic Energy Research Institute	
<b>Intelligent Robot System Using Model of Knowledge, Emotion and Intention and Information Sharing Architecture .....</b>	<b>2121</b>
Toru Yamaguchi and Nobuhiro Ando Tokyo Metropolitan Institute Of Technology	
<b>Prototyping a Java-Embedded Multimedia Processor .....</b>	<b>2126</b>
Masa-Aki Fukase <sup>1</sup> , Progyna Khondkar <sup>2</sup> , and Tadao Nakamura <sup>2</sup> <sup>1</sup> Hirosaki University, <sup>2</sup> Tohoku University,	
<b>CORBA and Web Technologies Applied to Long Distance Learning.....</b>	<b>2131</b>
Alexandre Fonte and Jose Carlos Metrolho Escola Superior de Tecnologia de Castelo Branco	
<b>Vision Based Lateral Control by Yaw Rate Feedback .....</b>	<b>2135</b>
Ju yong Choi <sup>1</sup> , Chang sup Kim <sup>1</sup> , Jong Il Bae <sup>2</sup> , Sinpyo Hong <sup>1</sup> , Man hyung Lee <sup>1</sup> , and Fumio Harashima <sup>3</sup> <sup>1</sup> Pusan National University, <sup>2</sup> Pukyong National University, <sup>3</sup> Tokyo Metropolitan Institute of Technology	
<b>H Steering Control for the Unmanned Vehicle System.....</b>	<b>2139</b>
Chang Sup Kim <sup>1</sup> , Ju Yong Choi <sup>1</sup> , Jong Il Bae <sup>2</sup> , Sinpyo Hong <sup>1</sup> , and Man Hyung Lee <sup>1</sup> , and Fumio Harashima <sup>3</sup> <sup>1</sup> Pusan National University, <sup>2</sup> Pukyong National University, <sup>3</sup> Tokyo Metropolitan Institute of Technology	

<b>A Multi-Ring Scheduling Strategy for Profibus Networks .....</b>	<b>2144</b>
Lucia Lo Bello and Orazio Mirabella University of Catania	

**ISFA: Interactive Session on Factory Automation**

Friday, Nov 30, 1:00PM to 1:50PM

<b>Sliding Mode Controller for Automatic Steering of Vehicles .....</b>	<b>2149</b>
Jingrui Zhang <sup>1</sup> , Shijie Xu <sup>2</sup> , and Ahmed Rachid <sup>1</sup> <sup>1</sup> Univ. de Picardie-Jules Verne, <sup>2</sup> Beijing Univ. of Aeronautics and Astronautics	

**ISME: Interactive Session on Mechatronics**

Friday, Nov 30, 3:00PM to 3:50PM

<b>Fuzzy Logic Controller for Micro-Robot Soccer Game .....</b>	<b>2154</b>
Elmer Dadios and Odon Maravillas De La Salle University	

<b>Hand System of Robotic Manipulator with Human Interface using Laser Pointer .....</b>	<b>2160</b>
Yoshihiko Takahashi and Makoto Yashige Kanagawa Institute of Technology	

<b>Development of Path Tracking Control for Omni-Directional Mobile Robot using Visual Servo System .....</b>	<b>2166</b>
Shoichiro Fujisawa <sup>1</sup> , Mitsuhiro Ryuman <sup>1</sup> , Toru Yamamoto <sup>2</sup> , Hiroyuki Sogo <sup>1</sup> , Yoshikazu Suita <sup>1</sup> , and Takeo Yoshida <sup>3</sup> <sup>1</sup> Takamatsu National College of Technology, <sup>2</sup> Hiroshima University, <sup>3</sup> Osaka Prefectural College of Technology	

<b>Sliding-Mode Direct Torque Control of an Induction Motor .....</b>	<b>2171</b>
Shir-Kuan Lin and Chih-Hsing Fang Institute of Electrical and Control Engineering, National Chiao Tung University	

<b>Service Robot for Hull Blasting .....</b>	<b>2178</b>
Andrés Iborra, Bárbara Álvarez, Francisco Ortiz, Fulgencio Marín, Carlos Fernández, and José María Fernández-Meroño Universidad Politécnica de Cartagena	

<b>A Walking Pattern Generation for Biped Robot with Parallel Mechanism by Considering Contact Force .....</b>	<b>2184</b>
Mitsuharu Morisawa <sup>1</sup> Yasutaka Fujimoto <sup>2</sup> , Toshiyuki Murakami <sup>1</sup> , and Kouhei Ohnishi <sup>1</sup> <sup>1</sup> Keio University, <sup>2</sup> Yokohama National University	

**ISSC: Interactive Session on Signals and Control**

Friday, Nov 30, 1:00PM to 1:50PM

<b>Laboratory Measurements On Magnetic Water Treatment Device .....</b>	<b>2190</b>
Viljem Kozic <sup>1</sup> , Juri Kropc <sup>2</sup> , Igor Ticar <sup>2</sup> , and Edvard Kiker <sup>1</sup> <sup>1</sup> Radenska d.d. Radenci, <sup>2</sup> University of Maribor	

<b>Variable Structure Control for Electrohydraulic Position Servo System .....</b>	<b>2194</b>
Mohamed A. Ghazy Helwan University	

<b>Speech Coding using Fourier-Bessel Expansion of Speech Signals .....</b>	<b>2199</b>
Kaliappan Gopalan Purdue University	

# Author Index

## A

Abbaszadeh, Karim 95  
Abdelkader, Yaser 147  
Abdelzاهر, Tarek 1810  
Abdessemed R. 2068  
Abolhassani, Mehdi 1388  
Abu-Rub, Haithem 630, 1195  
Adachi, Shuichi 323  
Agelidis, Vassilios 1475  
Aguilar, Mariana A 49  
Ahmad Azli, Naziha 1285  
Ahmed, Refaat 597, 1734  
Ahmed, Shehab. 630  
Ahn, Sung-Chan 1521  
Allmeling, Jost 1926  
Almeida, Aníbal T. 741  
Almeida, Otacilio 2080  
Almeida, Paulo E. M. 1844  
Almutairi, Naif 1515  
Al-Naseem, Osama 1125  
Alvarez, Barbara 188, 2178  
Alves, Mário 243  
Amin, Amr 882  
Anakwa, Winfred 90  
Ando, Nobuhiro 2121  
Ando, Noriaki 444  
Andrade, Javier 1850  
Aono, Toshihiro 546  
Arai, Ritsu 428  
Arai, Tatsuo 422  
Araki, Kuniya 1190  
Arao, Masaki 1  
Ares, Juan 1850  
Asama, Hajime 381  
Asher, Greg 1376  
Ashikawa, Manabu 799  
Athalye, Praneet 1078  
Atienza, Eric 832  
Augusto Filho, Sergio A 107  
Aydin, Metin 1428  
Azab, Mohamed 1262, 1268, 1280  
Azadmanesh, Azad 2022  
Azcondo, Francisco 1021, 1027  
Azli, Naziha Ahmad 921

## B

Babak, Fahimi 1577  
Bae, Jong Il 2135, 2139  
Bahawodin, Baha 2099  
Bajwa, Harinder 2022  
Bang, Kyung ho 707  
Banyasz, Csilla 746  
Barbosa, Fernando 289  
Battaiotto, Pedro 1172  
Becerra, Victor 736  
Bech, John 1959  
Belanger, Jean 1533  
Beliczynski, Bartlomiej 653  
Bell, David 147  
Bellini, Alberto 1527  
Bello, Lucia Lo 2144  
Benbouzid, M.E.H. 1406, 2068  
Bencsik, Attila L. 199  
Benedicic, Boris 19  
Benekohal, Rahim 1775

Benghanem, Mustapha 927  
Berezin, Alexander A. 1740  
Bernardon, Daniel 1370  
Bhadra, Sailendra 1494  
Bham, Ghulam H. 1775  
Bhattacharya, Tapas 1494  
Bialasiewicz, Jan T. 1988  
Bisogno, Fábio 1038  
Bitencout, Fabrício 64  
Bitó, János F. 220  
Blaabjerg, Frede 1243, 2000  
Blasco-Gimenez, Ramon 1376  
Bogosyan, O. Seta 357, 564  
Bonnice, William F. 1255  
Booth, Tim 170  
Borowy, Bogdan S. 1255  
Bose, Bimal K. 1631  
Bottura, Celso P 107  
Bouguechal, N.E. 1406  
Boumehez, Mohamed 782  
Bracho, Salvador 1021, 1027  
Brañas, Christian 1021  
Brihoum, Mohamed 1754  
Bullock, Darcy 1904  
Bullon, Javier 682  
Burgos, Rolando 1119  
Buso, Simone 1976  
Byun, Jong-Eun 215

## C

Capretz, Luiz 1834  
Capretz, Miriam 1834  
Cardenas, Roberto 1376  
Carlton, Doug 90  
Carrasco, Juanma 1138, 1274  
Carvalho, Adriano 299  
Casanueva, Rosario 1027  
Castro, Angel 943  
Cha, In-Su 2117  
Chae, Beom-Seok 1509  
Chakraborty, Chandan 1692  
Chan, Kenneth Kin-Chung 456  
Chan, T M 7  
Chang, Cheng-Yuan 474  
Chang, Chih-Feng 261  
Chang, Li-Jung 580  
Chang, Yi C. 159  
Charara, Ali 658  
Charatsis, Kostas 176  
Chattopadhyay, Ajit 1494  
Chen, Der-Fa 1451  
Chen, G R 718  
Chen, Jiann-Fuh 1033  
Chen, Jingquan 844  
Chen, Kung-Yi 529  
Chen, Sizhong 1892  
Chen, Yuehui 1  
Chen, Zhiqian 1667  
Chen, Zhiye 1067  
Cheng, Chun-An 1033  
Cheng, Fan-Tien 261  
Cheng, K.W.E. 838  
Cheng, Louis 1096  
Cheung, N.C. 838  
Cheung, Norbert C 456, 468  
Chiang, Chih-Hung 730  
Chino, Fumiho 1190

Chiquito, Luis A. 1027  
Cho, Jun-Dong 479  
Cho, Koon-Shik 479  
Cho, Kwan-Youl 931  
Cho, Sang hyun 707  
Cho, Sung-Oh 2117  
Choi, Ju Yong 410, 2135, 2139  
Choi, Jung-Yong 495  
Choi, Seung Gap 787  
Chow, Mo-Yuen 1593, 1794, 1844  
Christensen, Hans Christian 2000  
Chuang, Chia-Ming 1033  
Chun, Tae-Won 909  
Chung, Sung-Jong 215  
Clare, Jon 1376  
Coelho, Antonio 741  
Cohen, Eugene 90  
Colombo, Armando Walter 279  
Conceição, João 289  
Cook, Chris 351  
Corrêa, Jeferson 141  
Couto, Carlos 249, 255  
Covic, Grant 1049  
Cox, Daniel 462  
Crisóstomo, Manuel M. 1926  
Crowe, James 752

## D

Dadios, Elmer 2154  
De Doncker, Rik W. 792  
Del Valle, Yamille 1150  
Demonti, Rogers 1292, 1965  
Deng, Bing 193  
Derdiyok, Adnan 1400  
Destro, Ricardo C. 49  
Dhar, Sandeep 1874  
Diallo, D. 1406  
Dianguo, Xu 53, 1504  
Ding, Guo Qing 210  
Dixon, Juan 915, 1150  
Dorin, Neacsu 1583  
Draou, Azeddine 927, 1225, 2111  
Duan, Rou-Yong 580, 586, 635  
Duarte, Jorge 1994  
Dufour, Christian 1533  
Duque, Carlos A. 676

## E

Efe, Mehmet Onder 13, 31, 1563  
Egami, Toshihito 1932  
Egiziano, Luigi 972, 978  
Eguchi, Naoya 1207  
Ehsani, Mehrdad 1947  
El Dessouki, Ahmed 2038  
El Halwagy, Yehia 2050  
Elmenreich, Wilfried 369  
Eltabach, Mario 658  
Emadi, Ali 1001, 1008  
Endo, Tsunehiro 1680  
Engelbrecht, Roelof 1920  
Engell, Sebastian 724  
Enjeti, Prasad 1388  
Erickson, Robert 844, 893, 1078, 1515  
Escobar, Gerardo 1138, 1274  
Eskander, Mona 2099

Eskildsen, Kim 2000  
Espinoza, Jose R.915, 1102, 1108

## F

Fahimi, Babak 1015, 1947  
Fang, Chih-Hsing 2171  
Farhangi, Shahrokh 1015  
Farina, Jose 682  
Farooq, M 2044  
Fare, Felix Alberto 70, 141, 1370  
Femia, Nicola 972, 978  
Feng, Guang 1412  
Ferdous, Raihana 758  
Fernandez, Carlos 188, 937  
Fernández-Meroño, José María 937, 2178  
Fernando Silva, Jose 188  
Fernaõ Pires, Vitor 2178  
Ferrieux, Jean-Paul 832  
Ficocelli, M. 404  
Fisher, John 1915  
Fonte, Alexandre 2131  
Forrai, Alexandru 603  
Franceschetti, Nilson 1423  
Franceschini, Giovanni 1527  
Frincke, Deborah 84  
Fujii, Teruo 381  
Fujimoto, Yasutaka 2184  
Fujisawa, Shoichiro 2166  
Fukase, Masa-Aki 2126  
Funato, Hirohito 603, 1084  
Furukawa, Tatsuya 311, 799  
Furuta, Katsuhisa 305

## G

Gad, Ahmed 2044  
Gadoura, Idris 1072  
Galvan, Eduardo 1138, 1274  
Gan, Wai-Chuen 468  
Gao, Yimin 1947  
Garcia, Oscar 943  
Garcia, Pascal 2074  
Garcia, Rafael 1850  
Garrudo, Paulo 289  
Gaul, Thilo 1828  
Gerbaud, Laurent 832  
Ghazy, Mohamed 882, 2194  
Ghennai, C. 2068  
Giroux, Pierre 990  
Glen, Darrell 90  
Godler, Ivan 1722  
Gokasan, Metin 357, 564  
Golea, Amar 782  
Golea, Noureddine 782  
Gomes, Jonas R. 141  
Gomes, Pedro 770  
Gopalan, Kaliappan 2199  
Gopalarathnam, Tilak 1441  
Grady, Sean 170  
Grantham, C 1315  
Grantham, Colin 1364  
Grzesiak, Lech 653  
Guardia, Rafael de la 512  
Gueldner, Henry 805  
Guilin, Xie 1483  
Gulez, Kayhan 1237  
Guven, Mustafa 1400

Guzinski, Jaroslaw 630, 1195

## H

Habib, Maki 1612 2093  
Hadlich, Thomas 285  
Haffner, José Felipe 647  
Hagino, Kojiro 692  
Haji, Masoud 95, 591  
Hajiyev, Chingiz 564  
Hamar, Janos 966  
Hansen, Anca Daniela 1959  
Hansen, Blake 1898  
Hansen, Lars Henrik 2000  
Hao, Chen 1483  
Hao, Zhifang 688  
Harakawa, Tetsumi 523  
Harashima, Fumio 1237, 2135, 2139  
Hartmann, Michael 2012  
Hasanuzzaman, Md. 1061  
Hasgeawa, Masaru 1394  
Hashimoto, Hideki 444, 2066  
Hashimoto, Kunimatsu 1722  
Hashimoto, Seiji 323, 603  
Hashiyama, Tomonori 1941  
Hata, Seiji 267  
Hatakeyama, Shoshiro 305  
Hatanaka, Yoshinori 137  
Hatano, Yasuo 1766  
Hattori, Satomi 1673  
Hayakawa, Yoshinori 428, 1710  
Hendrix, Marcel 1994  
Hernández, Franco 915  
Higuchi, Kohji 1190  
Himavathi, Srinivasan 664  
Hinkkanen, Marko 1333, 1339  
Hirai, Akira 238  
Hiraishi, Daichi 1201  
Hiraki, Eiji 850, 856, 876  
Ho, Weng-Khuen 484  
Hoang, Le-Huy 1603  
Hofmann, Wilfried 1213  
Honda, Y. 1655  
Hong, Sinpyo 410, 2135, 2139  
Hong, Won-Kyu 2006  
Hori, Takamasa 1673, 1704  
Hori, Yoichi 1417, 1692, 1698  
Horváth, László 273  
Hosoda, Tatsuo 232, 238  
Hsieh, Guan-Chyun 1090  
Hsieh, Hung-I 1090  
Hsieh, Kuan-Yun 586  
Hsu, Shih-Chang 1661  
Hu, Xiaoguang 490  
Huang, Hsiao-Ping 730  
Huang, Lipei 1412  
Huang, Sunan 758  
Huang, Surong 1428  
Huang, Yi-Shuo 888  
Huelsman, Lawrence 1763  
Huggins, Brian 170  
Hyun, Dae Sung 615  
Hyun, Dong-Seok 1132, 1509, 1521

## I

Iborra, Andres 188, 2178  
Ibrahim, Ahmad 1754

Ichikawa, Shinji 1667  
Ide, Kozo 1435  
Ie, Shinichirou 182  
Iijima, T. 1655  
Inaguma, Yukio 1463  
Inelmen, Erol 1746, 1750  
Inelmen, Kivanc 1750  
Inoue, Kenji 422, 856  
Iplikci, Serdar 31  
Ishibashi, Shojiro 558  
Ishida, Muneaki 1673  
Ishigure, Nobuyuki 1230  
Ishii, Rokuya 535  
Ishimaru, Ichirou 267  
Islam, Syed K. 1061  
Isobe, Daigoro 341  
Ito, Masanori 558  
Itoh, Yoshiaki 226  
Itou, Hiroki 182  
Itou, Hiroshi 182  
Iwaji, Yoshitaka 1680  
Iwanaga, Takuya 204  
Iwano, Ryuichiro 182  
Iwasaki, Makoto 363, 1716  
Iyama, Kouichirou 1704  
Izumi, Hiroshi 1766

## J

Jabbar, M.A. 1166  
Janosi, Lorand 1959  
Jeng, Jyh-Cheng 730  
Jeon, Jae Wook 215  
Jeong, Young-Uk 2117  
Jezernik, Karel 220, 335  
Ji, Yanchao 490  
Jia, Xiufang 688  
Jialin, Lu 1178  
Jin, Taotao 1539  
Jingzhuo, Shi 53, 1504  
Joachim, Holtz 1547  
Joe, Cheol-Je 903, 909  
Johnson, Brian 1915  
Johnson, M.A. 752, 764  
Joos, Geza 1102, 1108  
Jung, Gil-jo 995

## K

Kadjoudj, Mohamed 782, 2068  
Kalogeras, Athanasios 176  
Kamath, Girish 1344  
Kamiyama, K. 603  
Kaneko, Yasuyoshi 232, 238  
Kang, Dae-Wook 1132  
Kang, Ey Goo 811, 816  
Kang, Feel-Soon 954  
Kang, Gubae 1321  
Kang, Jeong-il 1249  
Kang, Kyoung-Don 1810  
Kang, Seong-Ho 462  
Kapsalis, Vassilis 176  
Karanayil, Baburaj 1315  
Kashiwagi, Toshiyuki 1932  
Katebi, M.R. 764  
Kato, Kentaro 422  
Kawabata, Kuniaki 381  
Kawaji, Shigeyasu 1

Kawamura, Atsuo 329, 1207  
 Kaynak, Okyay 13, 31, 1563  
 Kazmierkowski, Marian 1114  
 Kerö, Nikolaus 518  
 Keviczky, Laszlo 746  
 Khambadkone, A.M. 1166, 1219  
 Khan, Muhammad Mansoor 820, 826  
 Khatri, Vijay 1096  
 Khemaissia, Seddik 2086  
 Khondkar, Progyna 2126  
 Kihara, Takahiro 1160, 1457  
 Kikerl, Edvard 2190  
 Kim, Chang Sup 995, 2135, 2139  
 Kim, Chan-ki 410  
 Kim, Cheul-U 954  
 Kim, Gi-Taek 495  
 Kim, Hag-Wone 931, 1184  
 Kim, Heung-Geun 909  
 Kim, Hyuck-Soo 495  
 Kim, Hyun-Soo 1184  
 Kim, In-Dong 903, 909  
 Kim, Joon-Woo 215  
 Kim, Jung-Han 621  
 Kim, Junha 1321  
 Kim, Ki tae 707  
 Kim, Min 2117  
 Kim, Sangho 1910  
 Kim, Sangsig 811, 816  
 Kim, Tae-Sung 1521  
 Kimura, Gunji 1469  
 King, Bradley 1816  
 Kitano, Tatsuya 1309  
 Kmecl, Tomaz 19  
 Kobayashi, Jun 345  
 Kobayashi, Katsuhiko 137  
 Koide, Daiichi 1710  
 Komada, Satoshi 1704  
 Komatsu, Hayato 1686  
 Kondo, Keiichiro 1445, 1457  
 Koroušic-Seljak, Barbara 19  
 Kosuge, Kazuhiro 450  
 Kotsopoulos, Andrew 1994  
 Kovács, Zsolt L. 641  
 Kovbasa, Sergei 49  
 Kowatari, Takehiko 546  
 Kozic, Viljem 2190  
 Kozłowski, Wojciech 100  
 Krishnan, R. 1488, 1498  
 Kropel, Jurij 2190  
 Krzeminski, Zbigniew 1195  
 Kubichek, Robert 113  
 Kudo, Kenji 1710  
 Kugimachi, Hisataka 345  
 Kumon, Toshiro 363  
 Kwiatkowski, Slawomir 1838  
 Kwon, Eil 1910  
 Kwon, Taek Mu 1910  
 Kwong, Sam 7, 718  
 Kyte, Michael 1904, 1915

## L

Lai, Dishi 1892  
 Laid, Kefsi 1504  
 Lam, H. K. 25, 43, 570, 574, 626, 899  
 Larouci, Chérif 832  
 Lee, Byeong-Cheol 1055  
 Lee, Dong-Choon 787, 1144

Lee, Duk Man 2117  
 Lee, Gi-Je 215  
 Lee, G-Myoung 1144  
 Lee, Hee Sub 165  
 Lee, Jang-Myung 586  
 Lee, Jeng-Dao 615  
 Lee, Ki Dong 1822  
 Lee, Kyung Chang 410  
 Lee, Man Hyung 903, 2135, 2139  
 Lee, Min-Soo 1822  
 Lee, Sang Ho 615  
 Lee, Suk Gyu 43, 1822  
 Lee, T. H. 570, 574, 626, 899, 1509  
 Lee, Taek-Kie 609  
 Lee, Tong Heng 776, 1132  
 Lee, Woo-Cheol 147, 1509  
 Legowski, Stanislaw 990  
 Le-Huy, Hoang 2117  
 Lempinen, Juha 960  
 Leung, F. H. F. 25, 43, 570, 574, 626, 899  
 Li, Dahai 1834  
 Li, Gengyin 1067  
 Li, Guangkai 1067  
 Li, Song 506  
 Liang, Tsong-Juu 1033  
 Lim, KhiangWee 484  
 Lin, Chang-Hua 1090  
 Lin, Ku-Chin 393, 529  
 Lin, Liang Ming 210  
 Lin, Quan 1892  
 Lin, Shir-Kuan 2171  
 Lin, Tao 670  
 Lindhard, Ulf 2000  
 Ling, S. H. 25  
 Lipo, Thomas 1428  
 Liu, Chang-Huan 1661  
 Liu, Chio-Hao 1661  
 Liu, Jiang 1789  
 Liu, Mingjian 838  
 Liu, Nai-Jian Wang 1661  
 Liu, Qian 870  
 Liu, Teng 870  
 Liu, Tian-Hua 1451  
 Liu, Wei-Hsiang 1090  
 Liu, Wei-Kuo 635  
 Lopez, Jose 90  
 Lorenzo, Angel 682  
 Losic, Novica 1096  
 Löwe, Welf 1339  
 Luo, Ren C. 159, 375, 416, 1828  
 Luomi, Jorma 1333, 2062

## M

Machado, Carlos 770  
 Machado, Ricardo 1982  
 Mademlis, Christos 1475  
 Madsen, Peter Hauge 2000  
 Mae, Yasushi 422  
 Maffrand, Carlos 1150  
 Mahlein, Jochen 1044  
 Makouf, A. 1406  
 Maksimovic, Dragan 844, 893, 1078, 1874  
 Malinowski, Aleksander 170, 1622, 1758, 1838, 1868  
 Malinowski, Mariusz 1114  
 Malkhandi, Sauradip 131  
 Mamo, Mengesha 1435

Mamun, Abdullah Al 609  
 Man, K F 7, 718  
 Manic, Milos 84, 1862, 2017  
 Manjrekar, Madhav 1970  
 Maravillas, Odon 2154  
 Margala, Martin 1892  
 Marín, Fulgencio 1976  
 Marino, Perfecto 2178  
 Marra, Enes 387  
 Marshall, Brett 1982  
 Martin, Peter 1771  
 Martinez, Emilio 1898  
 Martins, António 387  
 Martins, Denizar Cruz 289, 1292  
 Martins, Geomar 1965  
 Masatoshi, Nakamura 204  
 Maseberg, Sönke 2012  
 Mast, Jochen 805  
 Matsui, Keiju 539, 1230, 1350  
 Matsui, Mikihiko 1309  
 Matsui, Nobuyuki 363, 1716  
 Matsui, Shirou 182  
 Matsumoto, Yasushi 1207  
 Matsuoka, Koichi 1445, 1457  
 Mattavelli, Paolo 1138  
 McKeever, John 119  
 Menézes, Benjamin 37  
 Metrolho, Jose Carlos 289, 2131  
 Milimonfared, Jafar 95  
 Miloud, Yahya 2111  
 Miloudi, Abdallah 1225  
 Mirabella, Orazio 2144  
 Miyamori, Gou 323  
 Miyazaki, Yukio 398  
 Mizuguchi, Tsuyoshi 428  
 Mohd Yatim, Abdul Halim 1285  
 Moll, Peter 351  
 Montanari, Marcello 641  
 Monteiro, Joao 255  
 Moon, Gun-Woo 931  
 Moon, Gun-Woo 1249  
 Moon, Seung Hyun 811, 816  
 Moradi, Mohammad H. 764  
 Moran, Luis 1102, 1108  
 Morán, Luis 444, 2184  
 Mori, Hisanao 915  
 Morioka, Kazuyuki 1150  
 Morisawa, Mitsuharu 1766  
 Moscibrodzki, Wojciech 1838  
 Moscrop, Jeff 351  
 Motoaki, Matsuzaki 363  
 Mukai, Hiro 512  
 Mukaidani, Hiroaki 500  
 Mukherjee, Kaushik 1494  
 Muljadi, Eduard 1988  
 Munasinghe, Sudath 204  
 Murakami, H. 1655  
 Murakami, Toshiyuki 2184  
 Murakoshi, Hideki 1766  
 Murata, Koushi 76  
 Muthukumar, K. 131  
 Mutoh, Nobuyoshi 1237  
 Nachtnebel, Herbert 518

## N

Nagai, Yasuhiro 76

Nagy, Istvan 966  
 Naik, Apruva 90  
 Nakai, Hideo 1463  
 Nakamura, Tadao 2126  
 Nakanishi, Yoichiro 137  
 Nakano, Kazushi 1190  
 Nakaoka, Mutsuo 850, 856, 876, 2032  
 Nam, Kwanghee 1321  
 Narazaki, K. 1655  
 Neacsu, Dorin O. 1255  
 Neubert, Ralf 279  
 Nho, Eui-Cheol 903, 909  
 Nichols, Andrew 1904  
 Niidome, Takuro 535  
 Nik Idris, Nik Rumzi 1285  
 Ninomiya, Tamotsu 1722  
 Nishi, Tatsuya 80  
 Nix, R. Gerald 1988  
 Nobuhiro, Kyura 204  
 Noga, Markus 1828  
 Noguchi, Toshihiko 1201  
 Nojima, Ryoichi 1303  
 Nordman, Mikael 100  
 Nwankpa, Chika 984

## O

Oe, Shunichi 1932, 1937  
 Ogata, Mitsukatsu 1237  
 Ogawa, Jun 433  
 Ogita, Masami 137  
 Oh, Jun-Ho 621  
 Ohchi, Masashi 311, 799  
 Ohishi, Kiyoshi 1710  
 Ohkawa, Fujio 345  
 Ohnishi, Kouhei 1237, 1728, 2184  
 Ohshima, Kenji 232  
 Ohtani, Hiroki 1463  
 Ohtani, Yoshimitsu 76  
 Ohtsuka, Kazumasa 1350  
 Ohya, Akihisa 398  
 Oka, Kiyoshi 450  
 Okafor, Frank 1213  
 Okina, Shinnosuke 381  
 Okuma, Shigeru 363, 1394, 1667, 1686, 1941, 2062  
 Oleschuk, Valentin 1243  
 Olivieri, Mauro 1880  
 Omura, Takehide 1201  
 Ooya, Hidetoshi 692  
 Orchard, Marcos 1150  
 Orille, A.L. 1262  
 Ortega, Romeo 1274  
 Ortiz, Francisco 2178  
 Ortúzar, Micah 1150  
 Oshima, Kenji 238, 439  
 Oyama, Jun 1435  
 Ozpineci, Burak 1061

## P

Padilha, Adriano Sanick 70  
 Palmer, John 1953  
 Pan, Ching-Tsai 888  
 Pan, JunMin 193  
 Pan, Kuan-Taa 1156  
 Pan, Yunhe 2105  
 Panda, Sanjib 1219

Papa, Gregor 19  
 Papadopoulos, George 176  
 Park, Cheol Jae 787  
 Park, Hong bae 707  
 Park, Jin-Woo 165  
 Park, Jung Il 615  
 Park, Jung-Pil 1357  
 Park, Sung-Jun 954  
 Park, Young-Wook 1055  
 Parker, Michael 1771  
 Parreiras, Nuno 289  
 Pastor, Juan Angel 188  
 Pastoriza, Vicente 387  
 Pavão, Rafael 1038  
 Pegel, Sabine 724  
 Peláez, Javier Roperro 49  
 Peña, Ruben 1898  
 Perales, Manolo 1376  
 Pereira, Luís Fernando Alves 1138  
 Pereira, Paulo T. 647  
 Pereira, Sílvia 2080  
 Peresada, Sergei 770  
 Pérez, Marcelo 641, 1102  
 Perrin, Joseph 1108  
 Pfitscher, Luciano 1370  
 Phang, S. H. Henry 416  
 Pierre, John 113  
 Pimentel, Juan 1800  
 Pinheiro, Humberto 1038  
 Pirabakaran, Kandisami 736  
 Pires, Vitor F. 1926  
 Pitzek, Stefan 369  
 Pomilio, José 1976, 1982  
 Popov, Vladimir 70  
 Portugal, Paulo 299  
 Prado, Ricardo 1038  
 Prodic, Aleksandar 893  
 Pulvermueller, Elke 1856

## Q

Qiao, Chongming 949, 1539

## R

Rachid, Ahmed 2149  
 Rahkala, Matti 1072  
 Rahman, Faz 1315, 1364  
 Raina, Mona 1327  
 Rantanen, Jaana 125  
 Rauscher, Thomas 153  
 Resende, Peterson 37  
 Ribeiro, Moisés Vidal 676  
 Rieber, Jochen M. 552  
 Riedl, Matthias 285  
 Riesgo, Teresa 943  
 Rodriguez, Santiago 1850  
 Rodriguez-Andina, Juan J. 682  
 Roh, Chung-Wook 1249, 1357  
 Rojko, Andreja 335  
 Romano, João Marcos T. 676  
 Ronchi, Fabio 641  
 Roudet, James 832  
 Rovatti, Riccardo 1527  
 Rudas, Imre J. 220, 273, 1646  
 Rukonuzzaman, M. 2032  
 Runyan, Bruce 1344  
 Ryu, Je-Hyuk 479

Ryuman, Mitsuhiro 2166

## S

Sacristan, Teodoro 1800  
 Saeki, Kouichi 433  
 Saha, S. 1655  
 Sakamaki, Kazumi 1766  
 Sakamoto, Kiyoshi 1680  
 Salonen, Pekka 125  
 Samons, Kelly 119  
 Sangswang, Anawach 984  
 Sano, Masaki 428  
 Santamaria, Miguel 387  
 Sato, Mitsuhiro 1160  
 Satoh, Eiji 1463  
 Satoru, Goto 204  
 Sauter, Thilo 153, 518  
 Sawada, Yoshio 1303  
 Sawada, Yuichi 512  
 Sawamura, Mitsujiro 1435  
 Scheible, Guntram 805  
 Schertz, Donald R. 1781  
 Schoop, Ronald 279  
 Schwarzer, Ulrich 792  
 Sebastine, Seejo 1810  
 Segawa, Yasunobu 323  
 Seidel, ÁLysson 1038  
 Seki, Hirokazu 1698  
 Sen, P.C 2026  
 Sen, P.K. 1953  
 SenGupta, Sabyasachi 1494  
 Seok, Jul-Ki 1055  
 Serena, Sergio 949  
 Serodio, Carlos 255  
 Setti, Gianluca 1527  
 Severson, Jared 1953  
 Seyoum, Dawit 1364  
 Sharif, Leila H. 439  
 Sharifi, F. Janabi 58, 404  
 Shi, Yigang 2026  
 Shibanuma, Kiyoshi 450  
 Shima, Daisuke 267  
 Shimizu, Etsuro 558  
 Shyu, Kuo-Kai 474, 1156  
 Sidahmed, Ménad 658  
 Siguenza, Cesar 387  
 Silva, Pedro 255  
 Simões, M. Godoy 1044  
 Simoes, Marcelo 49, 1423, 2080  
 Simon, Olaf 1953  
 Sinha, S. K. 131  
 Sitapati, K. 1488  
 Smedley, Keyue 949, 1539  
 Soares, Filomena 770  
 Soares, Rui 770  
 Sørensen, Poul 1959  
 Sogo, Hiroyuki 2166  
 Son, Sang 1810  
 Songjiao, Shi 293, 704  
 Soucek, Stefan 153  
 Spagnuolo, Giovanni 972, 978  
 Speck, Andreas 1856  
 Speyer, Jason 410  
 Staley, Amanda 1488  
 Stankovic, Alex 1138, 1274  
 Stemmler, Herbert 1125  
 Stewart, Thomas 1771

Stielau, Oskar 1049  
Strickland, Robin 1763  
Su, Gui-Jia 119  
Su, Kuo L. 416  
Suardiaz, Juan 188  
Sugawara, Ken 428  
Sugimoto, Tomotaka 439  
Suh, Gloria 615  
Suita, Yoshikazu 2166  
Sun, Kai 1412  
Sun, Shouqian 2105  
Sung, Man Young 811, 816  
Suntio, Teuvo 960, 1072  
Suzuki, Satoshi 305  
Suzuki, Tatsuya 363, 1686  
Sybille, Gilbert 990  
Szemes, Peter 444

## T

Ta, Cao-Minh 1417, 1692  
Tahri, Ali 927  
Takagi, Shoji 698  
Takagi, Tomohiro 80  
Takahashi, Taro 329  
Takahashi, Yoshihiko 433, 2160  
Takai, Hiroyuki 317  
Takakura, Yuhachi 1680  
Takano, Ichiro 1303  
Takayama, Masayuki 311  
Takei, Hiroto 1716  
Takeo, Koji 450  
Takeuchi, Akira 1297  
Tam, P. K. S. 25, 43, 570, 574, 626, 899  
Tan, Anzhong 323  
Tan, Kok Kiong 758  
Tang, K S 7, 718  
Tani, Hideaki 1937  
Tar, József K. 220  
Tarbouchi, Mohamed 2038, 2050  
Tassoni, Carla 1527  
Tavares, Adriano 249  
Tay, Gek Hung 609  
Taylor, David 506, 552  
Tazawa, T. 1655  
Teichmann, Ralph 862  
Temeltas, Hakan 357  
Terada, Kenji 1932, 1937  
Tesar, Delbert 462  
Thron, Mario 285  
Ticar2, Igor 2190  
Tilli, Andrea 641  
Tipsuwan, Yodyium 1593, 1794, 1844  
Tokumaru, Haruki 1710  
Tolbert, Leon M. 1061  
Toliyat, Hamid 95, 591, 630, 1195, 1327, 1388, 1441  
Tomita, Mutuwo 1667  
Tonelli, Mauricio 1172  
Tovar, Eduardo 243  
Tran, Phuoc 1886  
Tripathi, Anshuman 1219

Trzynadlowski, Andrzej 1114  
Tsai, Chih Shan 375  
Tsai, Ming-Ching 529  
Tsuboi, Kazuo 539  
Tsuchiya, Junichi 1469  
Tsuji, Mineo 670  
Tsuru, Koji 76  
Tujimoto, Takahiro 523  
Tzou, Jyh Hwa 159, 416

## U

Uceda, Javier 943  
Uchida, Kenji 1457  
Uchida, Toshiyuki 1417  
Uchiyama, Naoki 698  
Ueda, Fukashi 539, 1230  
Ueda, Yoshiyuki 799  
Ugajin, Takashi 1766  
Umamaheswari, Bhaskaran 664  
Utkin, Vadim 1400

## V

Vähämäki, Olavi 978  
Valla, María 100  
Van Dyke, James 1172  
Vasques, Francisco 1806  
Vitelli, Massimo 243, 972

## W

Wai, Rong-Jong 580, 586, 635  
Wakao, Shinji 1160, 1457  
Wall, Richard 1816  
Wang, Chwei-Sen 1049  
Wang, Fanbin 870  
Wang, Qing-Guo 776  
Wang, Zhi Wu 210  
Watanabe, Tomoki 1382  
Watanabe, Toshinori 428  
Weaver, Alfred 1639, 1784, 1806, 2056  
Weigold, Joerg 1044  
Wells, Richard 1915  
Wiechmann, Eduardo 1119  
Wijenayake, Ajith 1970  
Wilamowska, Katarzyna 1862  
Wisniewski, Matthew 113  
Woo, Sung-Min 1132  
Wood, Richard 1344  
Wu, Jie 838  
Wu, Shang-Lun 261  
Wu, Zhi-Ming 820

## X

Xi, YunXia 484  
Xu, Dehong 1309  
Xu, Shijie 2149  
Xu, Yurong 2105

## Y

Yachi, Toshiaki 1297  
Yamada, Eiji 670  
Yamada, Yasushi 137  
Yamaguchi, Junichi 1937  
Yamaguchi, Toru 2121  
Yamamoto, Hiroki 1728  
Yamamoto, Isamu 539, 1350  
Yamamoto, Toru 2166  
Yamamura, Tsugio 1160  
Yamane, Satoshi 238, 439  
Yamane, Yuzo 712  
Yamashita, Michihiro 1382  
Yamashita, Nobuhiko 1297  
Yan, Guo Zhen 210  
Yan, Zhang 1400  
Yanagi, Shinji 311  
Yanagisawa, Hitoshi 1710  
Yanfeng, Zhang 1166  
Yang, Byeong-mo 995  
Yanmin, Su 1178  
Yano, Yoshikazu 1941  
Yao, Yugo 1350  
Yashige, Makoto 2160  
Yasuda, Gen'ichi 317  
Yatim, Abdul Halim Mohd 921  
Yazdani, Amirnaser 1015  
Ying, Jianping 870  
Yoon, Jeong-Phil 2117  
Yoshida, Masanobu 850  
Yoshida, Takeo 2166  
Yoshitsugu, Junji 856  
Youn, Myung-Joong 931, 1184, 1249, 1357  
Yu, Sheng-Po 635  
Yu, Wen-bin 490  
Yu, Xinghuo 13, 31  
Yubai, Kazuhiro 1704  
Yudong, Chen 293, 704  
Yusivar, Feri 1160, 1457  
Yuta, Shin'ichi 398

## Z

Zárate, Luis 53, 943  
Zein, Ismail 37  
Zenger, Kai 64  
Zhang, Dehua 658  
Zhang, Jingrui 1072  
Zhao, Chengyong 870, 2149  
Zheng, Feng 688  
Zhengxin, Weng 776, 1067  
Zhi-Ming, Wu 293  
Zhou, Ying 704  
Zhu, Rongyan 826  
Zongpei, Wang 1915  
Zumel, Pablo 712

# Tentative Schedule For IECON'01

Rooms:	Wind Star A	Wind Star B	Wind River A	Wind River B	Mesa Verde B	Grand Mesa F	
<b>Thursday, November 29, 2001</b>							
12:30PM to 12:50PM	<i>Opening Ceremony</i>						
1 PM to 2 PM	PE01 p.21	PE02 p.21	SC01 p.15	ET01 p.9	SS01 p.35 PM Mot.	Tut03-Fahmi	
2 PM to 3 PM						Tut07-Habib	
3 PM to 4 PM	PE03 p.22	PE04 p.22	SC02 p.16	FA01 p.11	SS02 p.35 AMC1	Tut08-Malinowski	
4 PM to 5 PM						Tut05-Chow	
5 PM to 6 PM	PE05 p.23	PE06 p.26	SC03 p.16	FA02 p.11	SS03 p.35 AMC2	Tut06-Le-Huy	
6 PM to 7 PM						Tut04-Neacsu	
7 PM to 8 PM	<i>Welcome Reception</i>						
<b>Friday, November 30, 2001</b>							
8 AM to 9 AM	PE07 p.23	PE08 p.24	SC04 p.17	ET02 p.9	SS04 p.36 Edu 1	TUT01 J. Holtz	
9 AM to 10 AM							
10 AM to 11 AM	PE09 p.24	PE10 p. 25	SC05 p.17	TUT02 Kaynak	SS05 p.36 Edu2		SS17 p.41 Tech Act.
11 AM to 12 PM							
12 PM to 1 PM	<i>Lunch</i>						
1 PM to 2 PM	Prof. Hirofumi Akagi "Advanced Power Electronics Based on Active Filtering and Energy Storage for..."						
2 PM to 3 PM	ME01 p.13	SS06 p.37 Net1	SC06 p.18	SS16 p.41 Knowledge	1:30 PP meeting	Power Electronics Panel	ISFA ISSC-p.43;
3 PM to 4 PM					3:15-5:30PM IES Officers' meeting		ISET-p.42
4 PM to 5 PM	ME02 p.13	SS07 p.37 Net2	SC07 p.18	ET03 p.10			ISME-p.43
5 PM to 6 PM							ISCI-p.41
6 PM to 7 PM					SS18. Memb. Activ.		ISPE-p.33;
<b>Saturday, December 1, 2001</b>							
8 AM to 9 AM	PE11 p.25	PE12 p.26	SC08 p.19	FA03 p.11		8:30AM-5:00PM IES AdCom Meeting	
9 AM to 10 AM							
10 AM to 11 AM	PE13 p.26	PE14 p.27	SC09 p.19	ME03 p.14	SS08 p.37 Soft 1		
11 AM to 12 PM							
12 PM to 1 PM	Lunch - Dr. Ralph Cavin "2001 International Technology Road map and its ramifications for research"						
1 PM to 2 PM	PE15 p.27	PE16 p.28	SS12 p.39 Image	ME04 p.14	SS09 p.38 Soft 2	8:30AM-5:00PM IES AdCom Meeting	
2 PM to 3 PM							
3 PM to 4 PM	PE17 p.28	PE18 p.29	CI01 p.8	ET04 p.10	SS13 p.39 Renew 1		
4 PM to 5 PM							
5 PM to 6 PM	<i>Banquet-Celebration of 50 years of IES</i>						
6 PM to 7 PM							
<b>Sunday, December 2, 2001</b>							
8 AM to 9 AM	PE19 p.29	PE20 p.30	CI02 p.8	FA04 p.12	SS14 p.40 Renew 2	Tut09-Bose	
9 AM to 10 AM							
10 AM to 11 AM	PE21 p.30	PE22 p.30	SC10 p.19	ME05 p.15	SS11 p.39 Transp.	Tut10-Weaver	
11 AM to 12 PM						Tut11-Rudas	
12 PM to 1 PM	<i>Lunch break</i>						
1 PM to 2 PM	PE23 p.31	PE24 p.31	SC11 p.20	CI03 p.8	SS15 p.40 Surviab.	SS10 p.38 LPE	
2 PM to 3 PM							
3 PM to 4 PM	PE25 p.32	PE26 p. 32	SC12 p.20	ME06 p.15	FA05 p.12		
4 PM to 5 PM							

All tutorials are listed on page 34