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**FM11**

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Mueller, Norbert Darmstadt Univ. of Tech.

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Chang, Joseph Heungsung Samsung Advanced Inst. of Tech.
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Park, J. H. Samsung Advanced Inst. of Tech.
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Co-Chair: O'Brien, Richard United States Naval Academy

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Mease, Kenneth D. Univ. of California at Irvine

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Haddad, Wassim M. Georgia Inst. of Tech.
Bernstein, Dennis S. Univ. of Michigan
Wilson, David A. The Univ. of Leeds

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Hill, David J. Univ. of Sydney
Wang, Youyi Y. Nanyang Tech. Univ.

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Co-Chair: Johnson, Michael A. Univ. of Strathclyde
Organizer: Johnson, Michael A. Univ. of Strathclyde
Co-Organizer: Huang, Hsiao-Ping National Taiwan Univ.

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Song, Tinglun Florida A&M - Florida State Univ.

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Mehra, Raman K. Scientific Systems Co., Inc.
Parham, Tom Bell Helicopter Textron, Inc.

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Lysevskii, Sergey Edward Purdue Univ. at Indianapolis

Chair: Berg, Jordan M. Texas Tech. Univ.
Co-Chair: Collins, Jr., Emmanuel G. Florida A&M - Florida State

Optimization of a Class of Nonholonomic Dynamic Systems
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**FM18**

**Nonlinear Identification and Fault Detection**

Chair: Makila, Pertti M. (Tampere Univ. of Tech.)
Co-Chair: Mendes, Eduardo (Fund. de Ensino Superior de Sao Joao)

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Cheung, Kie Chung  Univ. of Hong Kong
Wang, Ying  Univ. of Hong Kong
Chan, Wing Chi  Univ. of Hong Kong

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Vivalda, Jean-Claude  INRIA Lorraine, Projet CONGE

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Regan, Amy Los Alamos National Lab.
Wang, Y. M. Los Alamos National Lab.
Rohlev, T. Los Alamos National Lab.

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How, Jonathan P. Stanford Univ.

Graphs, Matrix Inequalities, and Switching for the Formation Flying Control of Multiple Spacecraft (I)
Mesbahi, Mehran California Inst. of Tech.
Hadaegh, Fred Y. California Inst. of Tech.

Exploiting Orbital Dynamics for Interstellar Separated Spacecraft Interferometry (I)
Kong, Edmund M. C. Massachusetts Inst. of Tech.
Miller, David W. Massachusetts Inst. of Tech.
Sedwick, Raymond J. Massachusetts Inst. of Tech.

New Tools for Formation Monitoring and Maintenance (I)
Hametz, Mark E. Al Solutions, Inc.
Conway, Darrel J. Al Solutions, Inc.
Weidow, David A. Goddard Space Flight Center
17:10  4163
Implementation of Autonomous GPS Guidance and Control for the Spacecraft Formation Flying (I)
Xing, Guang George Q.  Space Products and Applications, Inc.
Parvez, S. A.  Space Products and Applications, Inc.
Folta, David  NASA Goddard Space Flight Center

FP08
Intelligent Control: Vehicular Application
Chair: Birdwell, J. Douglas  Univ. of Tennessee
Co-Chair: Johnson, Jeffrey D.  Univ. of Toledo
15:30  4168
A Neural Network-Based Approach to Active Structural Mode Suppression for Flexible Transport Aircraft
Lavretsky, Eugene  The Boeing Co.
Henderson, Dennis K.  The Boeing Co.
15:50  4173
PI Control of a Tailless Fighter Aircraft with Dynamic Inversion and Neural Networks
Schumacher, Corey  Air Force Research Lab.
Johnson, Jeffrey D.  Univ. of Toledo
16:10  4178
Robust Adaptive Control using Single-Hidden-Layer Feedforward Neural Networks
Mclarland, Michael B.  Air Force Research Lab.
Rysdyk, Rolf T.  Georgia Inst. of Tech.
Calise, Anthony J  Georgia Inst. of Tech.
16:30  4183
Frequency Domain Robustness Analysis of Hopfield and Modified Hopfield Neural Networks
Shen, Jie  Univ. of Missouri-Rolla
Balakrishnan, S.N.  Univ. of Missouri-Rolla
16:50  4188
Sliding Mode Based Fuzzy Logic Controller for a Vehicle Suspension System
AL-Holou, Nizar  Univ. of Detroit-Mercy
Weaver, Jonathan  Univ. of Detroit-Mercy
Lahdhiri, Tarek  Univ. of Windsor
Joo, Dae Sung  Univ. of Detroit-Mercy
17:10  4193
Neuro-Fuzzy Control of Merging Vehicles for Automated Transportation Systems
Park, Jahng-Hyon  Hanyang Univ.
Ryu, Se-Hee  Hanyang Univ.

FP09
Power Systems
Chair: Utkin, Vadim I.  The Ohio State Univ.
Co-Chair: Kwatny, Harry  Drexel Univ.
15:30  4198
Singular Sets and Surfaces and their Implications in Power Systems
Ayasun, Saffet  Drexel Univ.
Nwankpa, Chika O.  Drexel Univ.
Kwatny, Harry  Drexel Univ.
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<td>16:10</td>
<td>4208</td>
<td>Model Reduction for Analysis of Cascading Failures in Power Systems</td>
<td>Parrilo, Pablo A., Lall, Sanjay, Paganini, Fernando, Verghese, George C., Lesieutre, Bernard, Marsden, Jerrold E.</td>
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<td>(California Inst. of Tech., Univ. of California at Los Angeles, Massachusetts Inst. of Tech., in press)</td>
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<td>16:30</td>
<td>4213</td>
<td>Nonlinear Identification and Control of Turbogenerators using</td>
<td>Brown, Michael D., Irwin, George W. Univ. of Leeds, Queen's Univ. of Belfast</td>
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<td>17:10</td>
<td>4223</td>
<td>PC Based Fuzzy-Neuro Controller for Synchronous Generator</td>
<td>Buelna, Carlos, Soto, Rogelio Delphi Automotive Systems, Cd., ITESM, Campus Monterrey</td>
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**FP10**

Estimation and Target Tracking

Chair: Chowdhury, Fahmida N. Univ. of Southwestern Louisiana
Co-Chair: Hong, Lang Wright State Univ.

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<td>15:30</td>
<td>4228</td>
<td>Target Tracking using Interacting Multipattern Probabilistic Data Association (IMP-PDA)</td>
<td>Hong, Lang, Cui, Ningzhou Wright State Univ., Wright State Univ.</td>
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<td>15:50</td>
<td>4233</td>
<td>Multisensor Tracking of a Maneuvering Target in Clutter using</td>
<td>Chen, Bing, Tugnait, Jitendra K. Auburn Univ., Auburn Univ.</td>
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<td>IMMMPDA Fixed-Lag Smoothing</td>
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<td>16:10</td>
<td>4238</td>
<td>Stable Recursive Estimators for Systems with Multiple Models</td>
<td>Nagpal, Krishan M. Standard and Poor's</td>
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<td>16:30</td>
<td>4243</td>
<td>Analytic Tracking Solutions with Range-Dependent Errors</td>
<td>Fitzgerald, Robert Raytheon Co.</td>
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16:50 4248
Maneuvering Target Tracking using Error Monitoring and
Recovery Technique of Perception Net
Choi, Jae Weon
Pusan National Univ.
Fang, Tae Hyun
Pusan National Univ.

17:10 4253
Maneuver Detection and Target Tracking using State-Space
Optimal FIR Filters
Park, Sang Hwan
Seoul National Univ.
Kwon, Wook Hyun
Seoul National Univ.
Kwon, Oh-Kyu
Inha Univ.
Kim, Pyung Soo
Seoul National Univ.

FP11
Model Predictive Control
Chair: Hammer, Jacob
Univ. of Florida
Co-Chair: Manikonda, Vikram
Scientific Systems Co., Inc.

15:30 4258
A Model Predictive Control-Based Approach for Spacecraft
Formation Keeping & Attitude Control
Manikonda, Vikram
Scientific Systems Co., Inc.
Arambel, Pablo O.
Scientific Systems Co., Inc.
Gopinathan, Murali
Scientific Systems Co., Inc.
Mehra, Raman K.
Scientific Systems Co., Inc.
Hadaegh, Fred Y.
California Inst. of Tech.

15:50 4263
A New Model Predictive Control Strategy for Affine Nonlinear
Control Systems
Lizarralde, Fernando C.
Federal Univ. of Rio de Janeiro
Wen, John T.
Rensselaer Polytechnic Inst.
Hsu, Liu
Federal Univ. of Rio de Janeiro

16:10 4268
On Approximate Model Matching in Nonlinear Control
Hammer, Jacob
Univ. of Florida

16:30 4273
Closed Loop Pneumatic Position Control using Discrete Time
Model Regulation
Guvenc, Levent
Istanbul Technical Univ.

16:50 4278
Real-Time Adaptive Control using Neural Generalized Predictive
Control
Haley, Pamela J.
NASA Langley Research Center
Soloway, Don
NASA Ames Research Center
Gold, Brian
NASA Langley Research Center

17:10 4283
Efficient Robust Predictive Control
Kouvaritakis, Basil
Oxford Univ.
Rossiter, J. Anthony
Loughborough Univ.
Schuurmans, J.
Loughborough Univ.

FP12
Linear System II: Control
Chair: Gundes, A. Nazli
Univ. of California at Davis
Co-Chair: Keel, Lee H.
Tennessee State Univ.
15:30 Simultaneous Stabilization of Systems with Zeros at Infinity or Zero
Gundes, A. Nazli Univ. of California at Davis
Kabuli, M. Gunetkin Univ. of California at Davis

15:50 Multi-Rate Feedforward Tracking Control for Plants with Nonminimum Phase Discrete Time Models
Gu, Yuping Univ. of California at Berkeley
Tomizuka, Masayoshi Univ. of California at Berkeley

16:10 A Discrete Time Repetitive Control System for MIMO Plants
Jeong, Daehwa Fabien, Brian C. Univ. of Washington

16:30 Receding Horizon Control of Non-Uniformly Sampled Data Systems
Albertos, Pedro Salt, Julian Univ. Politecnica de Valencia

16:50 Design of Functional Observer in Transfer Function Form
Furuta, Katsuhisa Suzuki, Tomomi Tokyo Inst. of Tech.

17:10 On Root Locus Traps
Keel, Lee H. Bhattacharyya, Shankar P. Tennessee State Univ. Texas A&M Univ.

15:30 Optimizing Stability Bounds of Finite-Precision PID Controllers using Adaptive Simulated Annealing (I)
Chen, Shen Istepanian, Robert Habib Ryerson Polytechnic Univ.
Wu, Jun Istepanian, Robert Habib Ryerson Polytechnic Univ.

15:50 Economic Design Problem: Integrating Instrumentation and Control (I)
Lu, Jianbo Skelton, Robert E. Delphi Automotive Systems Univ. of California at San Diego

16:10 Optimal Finite Wordlength Digital Controller Realizations (I)
Fialho, Ian J. Georgiou, Tryphon T. The Boeing Co. Univ. of Minnesota
### FP14

**Design of PID Controllers: Advanced Methods and Multivariable Systems**

Chair: Johnson, Michael A.  
Co-Chair: Huang, Han-Pang  
Organizer: Johnson, Michael A.  
Co-Organizer: Huang, Han-Pang

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| 15:30  | 4343    | Selection of Pairing and Constrained Robust Decentralized PI Controllers (I) | Gagnon, E.  
Desbiens, Andre  
Pomericau, A.  
Univ. of Laval  
Univ. of Laval  
Univ. of Laval |
| 15:50  | 4348    | Synthesis of Plantwide Control Systems using PID Controllers (I)       | Wang, Ping  
Mcavoy, Thomas J.  
Univ. of Maryland  
Univ. of Maryland |
| 16:10  | 4353    | Multivariable Controller Autotuning with its Application in HVAC Systems (I) | Wang, Qing-Guo  
Hang, Chang Chieh  
Zhang, Yong  
Bi, Qiang  
National Univ. of Singapore  
National Univ. of Singapore  
National Univ. of Singapore  
National Univ. of Singapore |
| 16:30  | 4358    | An Adaptive and Iterative Scheme for PID Autotuning Based on Design Formulae (I) | Banyasz, Csilla  
Keviczky, Laszlo  
Hungarian Academy of Sciences  
Hungarian Academy of Sciences |
| 16:50  | 4363    | A Bilinear Controller with PID Structure (I)                          | Bumham, K. J.  
Dunoyer, A.  
Hibbard, D. F.  
Minihan, J. A.  
Coventry Univ.  
Coventry Univ.  
British Steel  
Coventry Univ. |
Algorithm for PID Controller Tuning using LQG Cost Minimization

Grimble, Michael John
Johnson, Michael A.
Univ. of Strathclyde
Univ. of Strathclyde

FP15
Control of Structures
Chair: Pao, Lucy Y.
Univ. of Colorado at Boulder
Co-Chair: Whorton, Mark
NASA/Marshall Space Flight Center

Successive Galerkin Approximation of Nonlinear Optimal Attitude Control
Lawton, Jonathan R.
Beard, Randall W.
Mclain, Timothy W.
Brigham Young Univ.
Brigham Young Univ.
Brigham Young Univ.

Flexible Space Structure Robust Vibration Control
Lin, Ching-Fang
Bao, Ping-An
Braasch, Sarah
American GNC Corp.
American GNC Corp.
American GNC Corp.

Finite Thrust Control for Satellite Formation Flying with State Constraints
Beard, Randall W.
Hadaegh, Fred Y.
Brigham Young Univ.
California Inst. of Tech.

An Analysis of Frequency-Domain Input Shaping Designs for Three-Mode Flexible Systems
Cutforth, Craig F.
Pao, Lucy Y.
Univ. of Colorado at Boulder
Univ. of Colorado at Boulder

Experimental Investigation of Active Control of Wind-Induced Vibration in Tall Structures
Young, Peter M.
Bienkiewicz, Bogusz
Colorado State Univ.
Colorado State Univ.

Active Control of Flexible Structure using Genetic Algorithms and LQG/LTR Approaches
Shen, Yaxi
Homaifar, Abdollah
North Carolina A&T State Univ.
North Carolina A&T State Univ.

FP16
H-Infinity Estimation
Chair: Charalambous, Charalambos D.
Mcgill Univ.
Co-Chair: Boukas, El-Kebir
Ecole Polytechnique de Montreal

Discrete-Time Risk-Sensitive Filters with Non-Gaussian Initial Conditions and their Ergodic Properties
Dey, Subhrakanti
Charalambous, Charalambos D.
Univ. of Maryland
Mcgill Univ.
Multiplier-Based Robust H\textsuperscript{\infty} Estimation with Application to Robust Fault Detection
Collins, Jr., Emmanuel G. Florida A&M - Florida State Univ.
Song, Tinglun Florida A&M - Florida State Univ.

Robust Kalman Filtering for Continuous-Time Markovian Jump Uncertain Systems
Shi, Peng Univ. of South Australia
Boukas, El-Kebir Ecole Polytechnique de Montreal
Agarwal, Ramesh K. Wichita State Univ.

Robust H\textsuperscript{\infty} Filtering Design with Pole Constraints for Discrete-Time Systems: an LMI Approach
Palhares, Reinaldo M. Pontificia Univ. Católica de Minas Gerais
Peres, Pedro L. D. Univ. of Campinas

Robust H\textsuperscript{\infty} Filtering of Uncertain 2-D Discrete Systems
Du, Chunling Nanyang Tech. Univ.
Xie, Lihua Nanyang Tech. Univ.
Soh, Yeng Chai Nanyang Tech. Univ.

H\textsuperscript{\infty} State Estimation of 2-D Discrete Systems
Du, Chunling Nanyang Tech. Univ.
Xie, Lihua Nanyang Tech. Univ.
Soh, Yeng Chai Nanyang Tech. Univ.

Oxford
Communications
Chair: Pasik-Duncan, Bozenna Univ. of Kansas
Co-Chair: Holst, Jan Lund Inst. of Tech.

Team Theory and Neural Approximators for Dynamic Routing in Communication Networks
Baglietto, M. Univ. of Genova
Parisini, Thomas Politecnico di Milano
Zoppoli, Riccardo Univ. of Genova

Analysis and Modeling of ATM Traffic Data
Chu, Yi Sprint Corp.
Duncan, Tyrone E. Univ. of Kansas
Matache, Mihaela Teodora Univ. of Kansas
Pasik-Duncan, Bozena Univ. of Kansas
Zimmer, P. Univ. of Kansas

Smith's Predictor for Congestion Control in TCP Internet Protocol
Mascolo, Saverio Politecnico di Bari

Fuzzy Logic Rate Control for the ABR Service Category in B-ISDN Networks
Harju, Jarmo Tampere Univ. of Tech.
Pulakka, Kimmo Tampere Univ. of Tech.
Rapidly Oscillating System for Frequency Demodulation
Belikov, Sergey Candescent Tech.
Belikov, Ruslan Princeton Univ.

Experimental Evaluation of a New Braking System for Use in Passive Haptic Displays
Munir, Saghir Georgia Inst. of Tech.
Tognetti, Lawrence Georgia Inst. of Tech.
Book, Wayne J. Georgia Inst. of Tech.

**FP18**

Model Reduction
Chair: Grigoriadis, Karolos M.
Co-Chair: Weiland, Siep Eindhoven Univ. of Tech.

A Behavioral Approach to Optimal Model Reduction
Roorda, Berend Univ. of Tilburg
Weiland, Siep Eindhoven Univ. of Tech.

H_2 and/or H_Infinity-Norm Model Reduction of Uncertain Discrete-Time Systems
Assuncao, Edvaldo Paulista State Univ.
Peres, Pedro L. D. Univ. of Campinas

Model Reduction of Large Scale Systems using Approximate Component Cost Analysis
Sidi-Ali-Cherif, Sofiene Univ. of Houston
Grigoriadis, Karolos M. Univ. of Houston
Subramaniam, Murugan Dynacs Engineering Co.

Model Reduction and Design of a Power Steering System
Orbak, Ali Yurdun Massachusetts Inst. of Tech.
Youcef-Toumi, Kamal Massachusetts Inst. of Tech.
Senga, Masaaki Massachusetts Inst. of Tech.

Hybrid Structures in Process Control
Enste, Udo RWTH Aachen
Epple, Ulrich RWTH Aachen

Model Reduction in the Physical Domain
Ye, Yong Massachusetts Inst. of Tech.
Youcef-Toumi, Kamal Massachusetts Inst. of Tech.