CACSD-MA1
Computational Tools for Modeling Uncertain Systems
Chair: Beck, Carolyn
Univ. of Illinois, Urbana-Champaign
Co-chair: D’Andrea, Raffaello
Cornell Univ.
Org.: Beck, Carolyn
Univ. of Illinois, Urbana-Champaign
Org.: D’Andrea, Raffaello
Cornell Univ.

10:00 (I) CACSD-1
Symbolic and Numerical Software Tools for LFT-Based Low Order Uncertainty Modeling
Varga, Andras
Looye, Gertjan
DLR Oberpfaffenhofen

10:20 (I) CACSD-7
Computer-Aided Uncertainty Modeling of Nonlinear Parameter-Dependent Systems, Part I: Theoretical Overview
Belcastro, Christine M.,
Morelli, Eugene A.,
Lim, Kyong B.

10:40 (I) CACSD-16
Computer-Aided Uncertainty Modeling of Nonlinear Parameter-Dependent Systems, Part II: F-16 Example
Belcastro, Christine M.,
Lim, Kyong B.,
Morelli, Eugene A.

11:00 (I) CACSD-24
Software for Modeling, Analysis, and Control Design for Multidimensional Systems
D’Andrea, Raffaello
Cornell Univ.

11:20 (I) CACSD-28
The Validation of Model Sets on the Basis of Closed-Loop Feedback System Generated Data
Dullerud, Geir E.
Univ. of Illinois, Urbana-Champaign
Smith, Roy
Univ. of California, Santa Barbara

11:40 (I) CACSD-34
Model Reduction of Complex Systems in the Linear-Fractional Framework
Lall, Sanjay
California Inst. of Tech.
Beck, Carolyn
Univ. of Illinois, Urbana-Champaign

CACSD-MA2
Hybrid Systems and Real-Time Simulation
Chair: Branicky, Michael S.
Case Western Reserve Univ.
Co-chair: Ravn, Ole
Tech. Univ. of Denmark
Org.: Lemmon, Michael
Univ. of Notre Dame

10:00 (I) CACSD-97
An Environment for Model-Checking of Logic Control Systems with Hybrid Dynamics
Kowalewski, S.,
Bauer, N.,
Preussig, J.,
Stursberg, O.,
Treseler, H.
Univ. of Dortmund
10:20 (I) CACSD-103
Modular Verification of a Fault-Tolerant Active Structure Controller: An Example
Wong-Toi, Howard Cadence Berkeley Labs

10:40 (I) CACSD-109
Fast Marching for Hybrid Systems
Branciky, Michael S., Hebbar, Ravi Case Western Reserve Univ.

11:00 (I) CACSD-115
Real-Time Distributed Software-In-The-Loop Simulation for Distributed Control Systems

11:20 (I) CACSD-120
Simulation and Animation in Simulink and VRML
Ravn, Ole, Larsen, Thomas D., Andersen, Nils A. Tech. Univ. of Denmark

CACSD-MA3
Automatic Code Generation for Automotive Applications
Chair: Toeppe, Steve Ford Motor Co.
Co-chair: Ruekgauer, Andreas dSpace Inc.
Org.: Toeppe, Steve Ford Motor Co.

10:00 (I) CACSD-200
Automatic Code Generation Requirements for Production Automotive Powertrain Applications
Toeppe, Steve, Bostic, Dave, Ranville, Scott, Rzemien, Kevin Ford Motor Co.

10:20 (I) CACSD-207
Using BEACON to Generate Embedded Software from Simulink Models
Englehart, Matthew Applied Dynamics Int.

10:40 (I) CACSD-213
Production Quality Code Generation from Simulink Block Diagrams
Hanselmann, Herbert, Kiffmeier, U., Koester, L., Meyer, M., Ruekgauer, A. dSpace GmbH

11:00 (I) CACSD-219
Towards a More Efficient Approach to Automotive Embedded Control System Development
Smith, Michael H., Elbs, Martin ETAS Inc.

11:20 (I) CACSD-225
A Qualitative Analysis of Automatic Code Generation Tools for Automotive Powertrain Applications
Wybo, David, Putti, David Motorola Virtual Garage

11:40 (I) CACSD-231
Software Architectures for OSEK/VDX Applications Using MATRIXx TM and AutoCode TM
Martin, Todd A. Integrated Systems, Inc.

CCA-MA4
Metal Processing
Chair: Takahashi, Ryouichi Sumitomo Metal Ind.
Co-chair: Takatsu, Haruo Yokogawa Electric Corp.
Org.: Takahashi, Ryouichi Sumitomo Metal Ind.

10:00 (I) CCA-1
Modeling for Control of Blast Furnace
Tsumura, Kouji Univ. of Tokyo

10:20 (I) CCA-7
Directional Considerations When Tracking Time-Variant Parameters
Waller, Matias, Saxen, Henrik Abo Akademi Univ.

10:40 (I) CCA-13
Hybrid Neural Network Multivariable Predictive Controller for Handling Abnormal Events in Processing Applications

11:00 (I) CCA-18
On the Possibility of Looperless Rolling on Hot Rolling Process
Katori, Hideo, Hirayama, Ryu, Ueyama, Takatsugu Nippon Steel Corp.
Furuta, Katsuhisa Tokyo Inst. of Tech.

11:20 (I) CCA-23
Strip Gage and Tension Control At Cold Tandem Mill Based on I.L.Q. Design Theory
Kadoya, Y., Ooi, T., Washikita, Y. Sumitomo Metal Ind.
Seiki, Y. Toshiba Corp.
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<tr>
<td>11:40</td>
<td>CCA-29</td>
<td>Application of Multivariable Technique in Temperature Control of Reheating Furnaces</td>
<td>Wang, Zhongjie, Shao, Cheng, Chai, Tianyou, Northeastern Univ.</td>
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<tr>
<td>12:00</td>
<td></td>
<td>* Nonlinear Model Predictive Control for the Isothermal Extrusion of Aluminum</td>
<td>Steiner, Max, ETH</td>
</tr>
<tr>
<td>11:40</td>
<td>CCA-51</td>
<td>Receding Horizon FIR Filter with Estimated Horizon Initial State and its Application to Aircraft Engine Systems</td>
<td>Han, Soo Hee, Kim, Pyung Soo, Kwon, Wook Hyun, Seoul Nat. Univ.</td>
</tr>
<tr>
<td>10:40</td>
<td>CCA-45</td>
<td>Control Structure Design Methods Applied to a Jet Engine</td>
<td>Harefors, Melker, Volvo Aero Corp.</td>
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<td>11:00</td>
<td>CCA-55</td>
<td>Receding Horizon Control of the Caltech Ducted Fan: A Control Lyapunov Function Approach</td>
<td>Jadbabaie, Ali, Yu, Jie, Hauser, John, California Inst. of Tech., Univ. of Colorado</td>
</tr>
<tr>
<td>11:20</td>
<td>CCA-57</td>
<td>QFT Based Robust/Fault Tolerant Flight Control Design for a Remote Pilotless Vehicle</td>
<td>Wu, Shu-Fan, Nanjing Univ. of Aeronautics &amp; Astronautics, Grimble, Michael J., Univ. of Strathclyde, Wei, Wei, Nanjing Univ. of Aeronautics &amp; Astronautics</td>
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**CCA-MA5**
**Flight Control I**
Chair: Yurkovich, Stephen, Ohio State Univ.
Co-chair: Keel, Lee H., Tennessee State Univ.

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<tbody>
<tr>
<td>10:00</td>
<td>CCA-33</td>
<td>Receding Horizon FIR Filter with Estimated Horizon Initial State and its Application to Aircraft Engine Systems</td>
<td>Han, Soo Hee, Kim, Pyung Soo, Kwon, Wook Hyun, Seoul Nat. Univ.</td>
</tr>
<tr>
<td>10:20</td>
<td>CCA-39</td>
<td>Bayesian Belief Networks for Fault Identification in Aircraft Gas Turbine Engines</td>
<td>Mast, Timothy A., Reed, Aaron T., Yurkovich, Stephen, Ashby, Malcolm, Adibhatla, Shrider, Ohio State Univ.</td>
</tr>
<tr>
<td>10:40</td>
<td>CCA-45</td>
<td>Control Structure Design Methods Applied to a Jet Engine</td>
<td>Harefors, Melker, Volvo Aero Corp.</td>
</tr>
</tbody>
</table>

**CCA-MA6**
**Integrated Design of Passive and Active Elements in Control Systems**
Chair: Obinata, Goro, Akita Univ.
Co-chair: Skelton, Robert E., Univ. of California, San Diego
Org.: Obinata, Goro, Akita Univ.

<table>
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<tr>
<td>10:00</td>
<td>CCA-69</td>
<td>Generation of Structural Design Constraints for Spaceborne Precision Pointing Systems</td>
<td>Becker, Gregory, Cubalchini, Ronald, Tham, Quang, Anagnost, John, Raytheon Systems Co.</td>
</tr>
<tr>
<td>10:20</td>
<td>CCA-75</td>
<td>Smart Tensegrity Structures: A Novel Concept for Spacecraft Structural Control</td>
<td>Skelton, Robert E., Univ. of California, San Diego</td>
</tr>
<tr>
<td>12:00</td>
<td>CCA-97</td>
<td>Integrated System Design by Separation</td>
<td>Iwasaki, Tetsuya, Tokyo Inst. of Tech.</td>
</tr>
</tbody>
</table>
### CACSD-MM1

**Numerical Methods for Systems**

Chair: Mehrmann, Volker  
Co-chair: Misra, Pradeep  
Org.: Van Dooren, Paul  
Org.: Mehrmann, Volker

2:00 (I)  
*On Invariant Subspaces of Hamiltonian Matrices*  
Mehrmann, Volker, Xu, Hongguo  
Tech. Univ. of Chemnitz

2:20 (I)  
*Numerical Solution of Linear Quadratic Control Problems for Descriptor Systems*  
Benner, Peter  
Univ. of Bremen  
Byers, Ralph  
Univ. of Kansas  
Mehrmann, Volker, Xu, Hongguo  
Tech. Univ. of Chemnitz

2:40 (I)  
*The Photon Diffusion Equation: Forward and Inverse Problems*  
Syrmos, Vassilis L., Yin, J., Yun, D.Y.Y.  
Univ. of Hawaii, Manoa  
Misra, Pradeep  
Wright State Univ.

3:00 (I)  
*Two Point Boundary Value and Periodic Eigenvalue Problems*  
Van Dooren, Paul  
Univ. Catholique de Louvain

3:20 (I)  
*Solving Linear and Quadratic Matrix Equations on Distributed Memory Parallel Computers*  
Benner, Peter  
Univ. of Bremen  
Quintana-Orti, Enrique S., Quintana-Orti, Gregorio  
Univ. Jaime

### CACSD-MM2

**Object Oriented Modeling and Simulation**

Chair: Elmquist, Hilding  
Co-chair: Engell, Sebastian  
Org.: Mattsson, Sven Erik  
Org.: Otter, Martin

2:00 (I)  
*An Object-Oriented Model for Hybrid Control Systems*  
Carpanzano, Emanuele, Ferrarini, Luca, Maffezzoni, Claudio  
Pol. di Milano

2:20 (I)  
*Recipe-Driven Batch Processes: Event Handling in Hybrid System Simulation*  
Fritz, Martin  
Software Design & Manag. GmbH  
Liefeldt, Andreas, Engell, Sebastian  
Univ. of Dortmund

### CACSD-MM3

**Automatic Code Generation**

Chair: Erkkinen, Tom J.  
Co-chair: Zurawka, Thomas  
Org.: Erkkinen, Tom J.  
Org.: Zurawka, Thomas

2:00 (I)  
*Safety-Critical Software Generation*  
Erkkinen, Tom J.  
Applied Dynamics Int.

2:20 (I)  
*Component-Node-Network: Three Levels of Optimized Code Generation with ASCET-SD*  
Honekamp, Uwe, Reidel, Justus, Werther, Kai, Zurawka, Thomas, Beck, Thomas  
ETAS GmbH

2:40 (I)  
*On the Compilation of Statecharts Models into Target Code for Embedded Systems*  
Erpenbach, Edwin, Stroop, Joachim, Rammig, Franz J.  
Univ. of Paderborn

3:00  
*Using the Adaptive Blockset for Simulation and Rapid Prototyping*  
Ravn, Ole  
Tech. Univ. of Denmark

3:20 (I)  
*Redefining the Process for Development of Embedded Software*  
Bryant, Steven E.  
Army-Space and Missile Def. Com.  
Key, Kent  
Military Tech., Inc.
CCA-MM4
PID Control
Chair: Yamamoto, Toru Okayama Pref. Univ.
Co-chair: Chen, Min-Shin Nat. Taiwan Univ.

2:00 CCA-103
PID Control Design and $H_{\infty}$ Loop Shaping
Panagopoulos, Helene, Astrom, Karl J. Lund Inst. of Tech.

2:20 CCA-109
Robust PID*(n-2) Stage PD Cascade Controller
Kitti, Tirasesth, Jongkol, Ngamwiwit, Prasit, Julsereewong,
Thanit, Trisuwannawat King Mongkut's Inst. of Tech.
Michihiko, Iida Tokai Univ.

2:40 CCA-115
Tuning PID Controller for a Plant with Under-Damped Response
Shen, Jing-Chung Nat. Huwei Inst. of Tech.

3:00 CCA-121
Tuning of PID Controller for Unstable Process
Tan, Wen, Yuan, Yingqin, Niu, Yuguang North China Electric Power Univ.

3:20 CCA-125
Generalized Minimum Variance Self-Tuning Pole-Assignment Controller with a PID Structure
Yamamoto, Toru Okayama Pref. Univ.
Inoue, Akira Okayama Univ.
Shah, Sirish L. Univ. of Alberta

3:40 CCA-131
Simultaneous Design of Structure and Control Systems for Two-Degree-Of-Freedom-Controller
Tanaka, Hideyuki, Sugie, Toshiharu, Katayama, Tohru Kyoto Univ.

CCA-MM5
Flight Control II
Chair: Calise, A. J. Georgia Inst. of Tech.
Co-chair: Adams, R. Raytheon Missile Systems

2:00 CCA-137
Adaptive Nonlinear Controller Synthesis and Flight Test Evaluation: On an Unmanned Helicopter
Corban, J.E. Guided Systems Tech., Inc.

2:20 CCA-143
Position Control by Feedback Linearization for a Simplified Helicopter Model
Rebeschiess, Sven, Roloff, Marc Tech. Univ. Berlin

2:40 CCA-146
Flight Control Design and Experiment of a Twin Rotor Helicopter Model via 2 Step Exact Linearization
Saeki, Masami, Imura, Jun-ichi, Wada, Yasunori Hiroshima Univ.

3:00 CCA-152
Multivariable Gain and Phase Margin Analysis of a Fully Coupled Six-Degree-Of-Freedom Guided Missile
Bar-on, Jonathan R., Adams, Robert Raytheon Missile Systems

3:20 *
Three-Axes Missile Autopilot Design: Form Linear to Nonlinear Control
Harcaut, J. P. Aerospatiale-Missiles
Siguerdidjane, H. École Superieure d'Electricite

3:40 CCA-158
A SDP Relaxation Approach to Air Traffic Control under Free Flight
Oh, Jae-Hyuk Massachusetts Inst. of Tech.

CCA-MM6
Micro Positioning
Chair: Hirata, Mitsuo Chiba Univ.
Co-chair: Robl, Christian Tech. Univ. Munchen

2:00 CCA-164
A Genetic Algorithm for the Tuning of a Discrete Adaptive Observer Implemented on an IBM Head/Disk Assembly
Thein, May-Win L., Rendon, Thomas, Misawa, Eduardo A. Oklahoma State Univ.
Design of a Tracking System Using N-Delay Two-Degree-Of Freedom Control and its Application to Hard Disk Drives
Takakura, Shinji
Toshiba Res. & Dev. Cen.

Integrated Design for High Robust Performance with Quick Time-Response: An Application to Head Positioning Control of a Hard Disk
Hara, Shinji,
Nishio, Masashi
Tokyo Inst. of Tech.
Maruyama, Tsugito
Fujitsu Lab. LTD.

Following Control of a Hard Disk Drive by Using Sampled-Data H∞ Control
Hirata, Mitsuo,
Atsumi, Takenori,
Murase, Akiyo,
Nonami, Kenzo
Chiba Univ.

H2-Control with Acceleration Feedback for a Micro Positioning System
Robl, Christian,
Englberger, Gerhard,
Farber, Georg
Tech. Univ. Munich

Multiobjectives Design of a Multirate Output Controller
Shen, Liang,
Er, Meng Joo
Nanyang Tech. Univ.

 Initializing Newton’s Method for Discrete-Time Algebraic Riccati Equations Using the Butterfly SZ Algorithm
Fassbender, Heike,
Benner, Peter
Univ. of Bremen

An Arithmetic for Rectangular Matrix Pencils
Benner, Peter
Univ. of Bremen
Byers, Ralph
Univ. of Kansas

Stability Radii of Polynomial Matrices
Genin, Yves,
Van Dooren, Paul
Univ. Catholique de Louvain

High-Performance Algorithms and Software for Systems and Control Computations
Sima, Vasile
Res. Inst. for Inf., Bucharest
Van Huffel, Sabine
Katholieke Univ. Leuven

Integrated Environment with the Modern Control Algorithms
Datta, Biswa Nath,
Sarkissian, Daniil
Northern Illinois Univ.
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<tr>
<td>4:40</td>
<td>CACSD-273</td>
<td>Ryerson Initiatives in Integrating the Internet, Multimedia Components, and Hand-On Experimentation into Problem-Based Control Education</td>
<td>Zywno, Malgorzata S., Kennedy, Diane C.</td>
<td>Ryerson Pol. Univ.</td>
</tr>
<tr>
<td>5:00</td>
<td>CACSD-279</td>
<td>DynaMit -Internet Based Education Using CACSD</td>
<td>Loehl, T., Pegel, S., Klatt, K.-U., Engell, Sebastian, Schmid, Christian, Ali, A.</td>
<td>Univ. of Dortmund, Ruhr-Univ. Bochum</td>
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<tr>
<td>5:20</td>
<td>CACSD-285</td>
<td>The Virtual Lab for Controlling Real Experiments via Internet</td>
<td>Jochheim, Andreas</td>
<td>Univ. of Hagen</td>
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<tr>
<td>6:00</td>
<td>CACSD-291</td>
<td>Using the World Wide Web for Teaching Control Systems Design</td>
<td>Henry, Jim</td>
<td>Univ. of Tennessee at Chattanooga</td>
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<tr>
<td>5:00</td>
<td>*</td>
<td>Controlling Flame Speed Using Countercurrent Shear</td>
<td>Strykowski, Paul, Forliti, D.</td>
<td>Univ. of Minnesota</td>
</tr>
<tr>
<td>4:40</td>
<td>CCA-225</td>
<td>Online Identification and Control of Aerospace Vehicles Using Recurrent Networks</td>
<td>Hu, Zhenning, Balakrishnan, S.N.</td>
<td>Univ. of Missouri, Rolla</td>
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**CCA-MP6**

**Motion Control**

- Chair: Ling, Bo
- Co-chair: Bonivento, C.

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<tr>
<td>5:00</td>
<td>CCA-267</td>
<td>Performance Improvement of Multivariable Linear System with Unmeasured External Disturbance</td>
<td>Ling, Bo Foxboro Co.</td>
</tr>
<tr>
<td>5:20</td>
<td>CCA-261</td>
<td>Error Feedback Sliding Mode Controllers in Output Regulation of Nonlinear Systems</td>
<td>Marconi, L. Passini, S. Bonivento, C. Univ. of Bologna</td>
</tr>
<tr>
<td>5:40</td>
<td>CCA-273</td>
<td>A Minimum-Time Motion Planning Method Based on Phase Space Analysis</td>
<td>Koh, K.C., Aum, H.S. Cho, H.S. Sun Moon Univ. KAIST</td>
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**1999 IEEE CCA/CACSD**

**CCA Plenary Presentation**

**Tuesday, August 24, 1999**

**Hapuna Ballroom**

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<td>8:30</td>
<td>CACSD-640</td>
<td>Computer Algebra in CACSD</td>
<td>Ogunye, Ayowale B. Drexel Univ.</td>
</tr>
<tr>
<td>10:00</td>
<td>CACSD-309</td>
<td>Symbolic Computation in Nonlinear Control System Modeling and Analysis</td>
<td>de Jager, Bram Eindhoven Univ. of Tech.</td>
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<tr>
<td>11:00</td>
<td>CACSD-315</td>
<td>Symbolic Manipulation of Rational Matrices and Applications</td>
<td>Karampetakis, N. P. Aristotle Univ. of Thessaloniki</td>
</tr>
<tr>
<td>11:40</td>
<td>CACSD-321</td>
<td>A Computer Aided Technique to Derive the Class of Realizable Transfer Function Matrices of a Control System for a Prescribed Order Controller</td>
<td>Tagawa, Yasutaka Tokyo Univ. of Agric. and Tech. Tagawa, Ryozaburo Hokkaido Univ.</td>
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**Koa**
CACSD-TuA2
CACSD Environments and Tools
Chair: Kucera, Vladimir
Co-chair: Varsamidis, Thomas
10:00 CACSD-380
Polynomial Toolbox and State Feedback Control
Kucera, Vladimir
Sebek, M.
Henrion, Didier
10:20 CACSD-386
Implementation Issues of a Unified Information Model-Based CACE Integrated Environment
Varsamidis, Thomas,
Hope, Sian,
Jobling, Christopher P.
10:40 CACSD-392
Use of a Prototype CACE Integration Framework Based on the Unified Information Model
Varsamidis, Thomas,
Hope, Sian,
Jobling, Christopher P.
11:00 CACSD-398
Bringing Metacomputing to Scilab
Desprez, Frederic
Fleury, Eric
Gomez, Claude,
Steer, Serge
Ubeda, Stephane
11:20 CACSD-404
Sampled-Data Control Toolbox: A Software Package via Object-Oriented Programming
Fujioka, Hisaya,
Yamamoto, Yutaka
Hara, Shinji
11:40 CACSD-410
MATLAB Based Tools for 2D Linear Systems with Application to Iterative Learning Control Schemes
Gramacki, J.,
Gramacki, A.,
Galkowski, K.
Rogers, E.
Owens, D.H.

CCA-TuA3
Control of Chemical Processes I
Chair: Cloutier, James R.
Co-chair: Hangstrup, Mads
10:00 CCA-893
Control of a Continuously Stirred Tank Reactor Using an
Asymmetric Solution of the State-Dependent Riccati Equation
Cloutier, James R.
Stansbery, Donald T.
10:20 CCA-899
Nonlinear Time-Scaling for Analysis and Controller Design of Reaction Systems
Moya, P.
Netto, M.S.,
Ortega, R.
Pico, J.
10:40 CCA-905
Gain-Scheduled Control of a Fossil-Fired Power Plant Boiler
Hangstrup, Mads E.,
Stoustrup, Jakob,
Andersen, Palle,
Pedersen, Tom S.
11:00 CCA-910
H∞ Control for a Boiler-Turbine Unit
Tan, Wen,
Niu, Yuguang,
Liu, Jizhen
11:20 CCA-915
Nonlinear MPC and Inferential Sensing for PVC Production
Havlena, V.
Barva, P.
12:00 CCA-921
Linear vs. Nonlinear Control of an Axial Flow Compressor
Fontaine, Dan
Liao, Shengfang,
Paduano, James D.
Kokotovic, Petar

CCA-TuA4
Electric Motors I
Chair: Tsai, M.C.
Co-chair: Fusco, Giuseppe
10:00 CCA-927
A New RST Cascaded Predictive Control Scheme for Induction Machines
Maaziz, M.K.,
Boucher, P.,
Dumur, D.
10:20 CCA-933
Analysis, Design, and Control of Advanced Brushless Synchronous Machines with Power Converters
Lyshevski, Sergey E., Sinha, A.S.C., Wylam, William, Cho, Peter
Purdue Univ., Indianapolis, Delco Remy America, Inc.

10:40 CCA-939
Rotor Position Detection of a Switched Reluctance Motors Using FM Technique
Wang, Y. J., Sun, Y.Y., Huang, C.C., Tsai, M.C.
Nat. Cheng Kung Univ.

11:00 CCA-945
A Practical Implementation of a Linear Induction Motor Drive Using New Generation DSP Controller
Tsai, Mi Ching, Chen, Jeng Hu
Nat. Cheng Kung Univ.

11:20 CCA-950
Transient Dynamics and Motion Control of Induction Motors
Lyshevski, Sergey E.
Purdue Univ., Indianapolis

11:40 CCA-956
$H_{\infty}$ Design of a Robust Speed Controller for Induction Motors
Chiaverini, Stefano, Figalli, Gennaro, Fusco, Giuseppe
Univ. degli Studi di Cassino

12:00 CCA-962
On Robust Stability of Two Flux Observers for Induction Machines
Medvedev, Alexander
Lulea Univ. of Tech.

CCA-TuA5
Ship Motions and Offshore Structures
Chair: Terada, Yuuji, Co-chair: Yamamoto, Ikuo
Mitsubishi Heavy Ind. Mitsubishi Heavy Ind.
Org.: Terada, Yuuji

10:00 (I) CCA-1096
Recent Development on Analysis and Control of Ship's Motions
Ohtsu, Kohei
Tokyo Univ. of Mercantile Marine

10:20 (I) CCA-1104
Controlling Line Tension in Thruster Assisted Mooring Systems
Aamo, Ole Morten, Fossen, Thor I.
Norwegian Univ. of Sci. & Tech.

10:40 (I) CCA-1110
Thruster Assisted Position Mooring System for Turret Anchored FPSOs
Sorensen, Asgeir J., Strand, Jann Peter, Fossen, Thor I.
Norwegian Univ. of Sci. & Tech., ABB Ind., Norwegian Univ. of Sci. & Tech.

11:00 (I) CCA-1118
Development of Inverse LMI Method and its Applications to Dynamic Positioning System
Yamamoto, Ikuo, Terada, Yuuji
Mitsubishi Heavy Ind.

CCA-TuA6
Mobile Robot and Vehicle Control
Chair: Larsen, Thomas D., Co-chair: Takemori, Fumiaki
Tech. Univ. of Denmark, Tottori Univ.

10:00 CCA-1003
Noncontact Hold and Transfer Control by a Magnetic Robot Hand Attached to a Mobile Robot with Two Independent Drive Wheels
Kojima, Hiroyuki, Yuasa, Yoshitaka, Kobayashi, Toshio
Gunma Univ.

10:20 CCA-1009
A New Approach for Kalman Filtering on Mobile Robots in the Presence of Uncertainties
Larsen, Thomas D., Andersen, Nils A., Ravn, Ole
Tech. Univ. of Denmark
10:40 CCA-1015
Robust Tracking and Regulation Control for Mobile Robots
Dixon, W.E., Dawson, D.M., Zergeroglu, E., Zhang, F.
Clemson Univ.

11:00 CCA-1021
Design of Kalman Filters for Mobile Robots; Evaluation of the Kinematic and Odometric Approach
Larsen, Thomas D., Hansen, Karsten Lentfer, Andersen, Nils A., Ravn, Ole
Tech. Univ. of Denmark

11:20 CCA-1027
Formation Control of Multiple Autonomous Vehicles
Kang, W., Xi, N.
Naval Postgraduate School, Michigan State Univ.

11:40 CCA-1033
Servo Control of Unstable-Wheeled System by Using Disturbance Torque Observer Compensation and Convex Optimization
Takemori, Fumiaki, Iwata, Jun-ichi, Okuyama, Yoshifumi
Tottori Univ.

12:00 CCA-1039
Interactive On-Line Evaluation of Robot Motion Control
Valera, A., Robertsson, A., Nilsson, K., Johansson, R.

CACSD-TuM1
Design Methods
Chair: Safonov, Michael G. Univ. of Southern California
Co-chair: Rotea, Mario A. Purdue Univ.

2:00 CACSD-328
Automatic PID Tuning: An Application of Unfalsified Control
Jun, Myungsoo, Safonov, Michael G.
Univ. of Southern California

2:40 CACSD-334
A Canonical Representation for Unfalsified Control in Truncated Spaces
Brugarolas, Paul B., Safonov, Michael G.
California Inst. of Tech., Univ. of Southern California

3:00 CACSD-340
Design of Static Cascade Compensators Using Generalized Singular Values
Rotea, Mario A.
Purdue Univ.

3:20 CACSD-346
Generalized Sampled and Hold Functions-Based Controllers Design for Uncertain Systems
Yu, Qi, Er, Meng Joo, Ni, M.L., Shen, L.
Nanyang Tech. Univ.

3:40 CACSD-351
H∞ Control of Linear Systems with Delayed Measurements
Shaked, Uri de Souza, Carlos E.
Tel-Aviv Univ., Lab. Nac. de Comp. Cient.

CACSD-TuM2
CACSD Tools in Flight Control
Chair: Levine, William S. Univ. of Maryland
Co-chair: Finsterwalder, Reinhard Univ. of Bundeswehr
Org.: Joos, Hans-Dieter DLR Oberpfaffenhofen

2:00 (I) CACSD-416
ICAD: An Appropriate CACSD Package for Aerospace Applications
Robertson, S.S., Leithead, W.E.
Univ. of Strathclyde, Univ. of Glasgow

2:20 (I) CACSD-422
CONDUIT-Control Designer's Unified Interface
Levine, William S.
Univ. of Maryland
Tischler, Mark B.
Army/NASA ARC

2:40 (I) CACSD-428
HAREM -Handling Qualities Research and Evaluation Using MATLAB
Duda, Holger, Duus, Gunnar
German Aerospace Cen.

3:00 (I) CACSD-433
Multi-Objective Design Assessment and Control Law Synthesis Tuning for Flight Control Development
Joos, Hans-Dieter Finsterwalder, Reinhard
DLR Oberpfaffenhofen, Univ. of Bundeswehr

3:20 CACSD-439
A Graphical User Interface for Flight Control Development
Finsterwalder, Reinhard Joos, Hans-Dieter, Varga, Andras
DLR Oberpfaffenhofen, Univ. of Bundeswehr

3:40 (I) CACSD-445
Near-Optimal Trajectory Generation for Autonomous Aircraft Landing
Yakimenko, Oleg A., Kaminer, Isaac I.
Naval Postgraduate School
CCA-TuM3

Neuro-Fuzzy Control of Chemical Processes
Chair: Wu, M. Central South Univ. of Tech.
Co-chair: Coelho, Antonio A. R. Fed. Univ. of Santa Catarina

2:00 CCA-1044
An Expert Control Strategy Using Neural Networks for the Electrolytic Process in Zinc Hydrometallurgy
Wu, Min Central South Univ. of Tech.
Nakano, Michio Takushoku Univ.
She, Jin-Hua Tokyo Univ. of Engr.

2:20 CCA-1050
Neuro-Fuzzy Control of a Steam Boiler-Turbine Unit
Alturki, Fahd A., Abdennour, Adel Ben King Saud Univ.

2:40 CCA-1056
Prediction of Flooding in an Absorption Column Using Neural Networks
Gowan, Hitesh Honeywell Hi-Spec Solutions
Indhar, Praveen Sasol Synthetic Fuels

3:00 *
Direct Supervisory Adaptive Fuzzy Controller Applied to pH Control
Nazaruddin, Yul Y., Astrid, P., Samyudia, Y. Bandung Inst. of Tech.

3:20 CCA-1062
Comparative Study of Parametric and Structural Methodologies in Identification of an Experimental Nonlinear Process
Marchi, Pierre Alibert, dos Santos Coelho, Leandro, Coelho, Antonio A.R. Fed. Univ. of Santa Catarina

3:40 CCA-1068
Adaptive Neural Model Predictive Control of Chemical Process: An Empirical Study
Wang, Dianhui Dalian Maritime Univ.

CCA-TuM4

Electric Motors II
Chair: Ohmori, Hiromitsu Keio Univ.
Co-chair: Reay, Donald S. Heriot-Watt Univ.

2:20 CCA-1073
Sensorless Position Detection Using Neural Networks for the Control of Switched Reluctance Motors
Reay, Donald S., Williams, B.W. Heriot-Watt Univ.

CCA-TuM5

Control Applications in Aerospace Systems
Chair: Kanai, Mikio Nat. Def. Acad.
Org.: Ochi, Yoshimasa Nat. Def. Acad.

2:00 (I) CCA-968
Orbit Determination by Means of Kalman Filter Using VLBI Data
Asai, Yoshihiko Higashinippon Int. Univ.
Nishimura, Toshimitsu Tokyo Engr. Univ.

2:20 (I) CCA-973
New Method of Capturing Tumbling Object in Space and its Control Aspects
Nakasuka, Shinichi, Fujiwara, Takeshi Univ. of Tokyo

2:40 (I) CCA-979
Robust Attitude Controller Design of Linear Parameter Varying Spacecraft via Mu Synthesis and Gain Scheduling
Nagashio, Tomoyuki, Kida, Takashi Univ. of Electro-Communications

3:00 (I) CCA-985
An Experimental Investigation of Active and Passive Control of Rotating Stall in Axial Compressors
Prasad, J.V.R., Neumeier, Y., Lal, M., Bae, S. H., Meehan, A. Georgia Inst. of Tech.
CCA-991
Guidance Performance Analysis of Bank-To-Turn (BTT) Missiles
Lee, Jang Gyu Seoul Nat. Univ.
Han, Hyung Seok Kyungwon Univ.
Kim, Young Jim Seoul Nat. Univ.

CCA-997
Automatic Approach and Landing for Propulsion Controlled Aircraft by $H_\infty$ Control
Ochi, Yoshimasa,
Kanai, Kimio Nat. Def. Acad.

CCA-TuM6
Mobile Robot and its Control Architecture
Chair: Fujii, Teruo Univ. of Tokyo
Co-chair: Yuh, Junko Univ. of Hawaii
Org.: Fujii, Teruo Univ. of Tokyo

CCA-1123
A Control System for an Omnidirectional Mobile Robot
Paromtchik, I.E.,
Asama, Hajime,
Fujii, Teruo,

CCA-1129
Decentralized Control of Mobile Robots in Coordination
Hirata, Yasuhisa,
Kosuge, Kazuhiro
Asama, Hajime,
Kata, Hayato,

CCA-1135
Application of Non-Regressor Based Adaptive Control to Underwater Mobile Platform-Mounted Manipulator
Lee, Pan-Mook KRISO
Yuh, Junko Univ. of Hawaii

CCA-1179
Sensor Fusion Technique for Cable Following by Autonomous Underwater Vehicles
Balasuriya, Arjuna
Ura, Tamaki

CCA-1141
Mobile Robot Teleoperation Using Local Storages
Kawabata, Kuniaki,
Ishikawa, Tatsuya,
Asama, Hajime,

CACSD-TuP1
Optimization-Based CACSD
Chair: Balakrishnan, Venkataramanan Purdue Univ.
Co-chair: Tits, Andre Univ. of Maryland

CACSD-357
DirectSD - A Toolbox for Direct Design of SD Systems
Polyakov, K. Yu,
Rosenvasser, Ye.N. State Univ. of Ocean Tech.
Lampe, Bernhard P. Univ. of Rostock

CACSD-363
Computation of Time Optimal Controls by Gradient Matching
Szymkat, Maciej,
Korytowski, A.,
Turnau, A. St. Staszic Tech. Univ.

CACSD-369
Direct Collocation and Nonlinear Programming for Optimal Control Problem Using an Enhanced Transcribing Scheme
Hu, G.S.,
Ong, Chong-Jin,
Teo, C.L. Nat. Univ. of Singapore

CACSD-375
Reliability-Directed Computer-Aided Design System
Abramov, Oleg V.,
Katueva, Y.V. Inst. for Autom. and Control Processes
Lazarev, G.I. Vladivostok State Univ.
Suponya, A.A. Inst. for Autom. and Control Processes

CACSD-TuP2
MaTX/RtMaTX: A Freeware for Integrated CACSD
Chair: Koga, Masanobu
Co-chair: Furuta, Katsuhisa
Org.: Koga, Masanobu

CACSD-451
MaTX/RtMaTX: A Freeware for Integrated CACSD
Koga, Masanobu

CACSD-457
Robot Motion Control by MaTX/RtMaTX
Yamakita, Masaki

CACSD-462
Modeling and Simulation of Mechanical Systems - Combination of a Symbolic Computation Tool and MaTX
Hoshino, Tasuku,
Furuta, Katsuhisa

CACSD-468
VRSC: Visual Robotic Simulation and Control with MaTX/RtMaTX
Nonaka, Kenichiro
### CCA-TuP3

**Control Applications in Flows and Turbomachines**

Chair: Copeland, G. Scott,  
Co-chair: Narayanan, Satish  
Org.: Copeland, G. Scott,  
Org.: Narayanan, Satish  

#### 4:20 (I) CCA-730

**Adaptive Detection of Instabilities and Nonlinear Analysis of a Reduced-Order Model for Flutter and Rotating Stall in Turbomachinery**

- Copeland, G. Scott  
- Kevrekidis, Ioannis G.  
- Rico-Martinez, Ramiro  

#### 5:20 (I) CCA-730

**Nonlinear Control Design for Rotating Stall with Magnetic Bearing Actuators**

- Wang, Yong  
- Paduano, James D.  
- Murray, Richard M.  

#### 4:40 (I)

**Dynamics, Visualization and Control of Mixing**

- Mezic, Igor  

#### 5:00 (I) CCA-1151

**Low-Dimensional Models for Active Control of Flow Separation**

- Narayanan, Satish,  
- Kubnik, Alexander I.,  
- Jacobson, Clas  
- Kevrekidis, Y.  
- Rico-Martinez, Ramiro  
- Lust, K.  

#### 5:40 (I) CCA-1157

**On the Design of Feedback Controllers for a Convecting Fluid Flow via Reduced Order Modeling**

- Burns, John A.,  
- King, Belinda B.  
- Rubio, Diana  

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### CCA-TuP4

**Applications of Adaptive Control for Systems with Nonsmooth Nonlinearities**

Chair: Lewis, Frank L.  
Co-chair: Cheng, J. John  
Org.: Tao, Gang  
Org.: Wen, Changyun  

#### 4:20 (I) CCA-1163

**Backlash Compensation in Nonlinear Systems Using Dynamic Inversion by Neural Networks**

- Selmic, Rastko R.,  
- Lewis, Frank L.  

#### 4:40 (I) CCA-1169

**Tracking Control in the Presence of Nonlinear Dynamic Frictional Effects: Robot Extension**

- Feemster, Matthew,  
- Dawson, D.M.,  
- Behal, A.,  
- Dixon, W.E.  

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### CCA-TuP5

**Flight Control III**

Chair: Mesbah, Mehran  
Co-chair: Ando, Yoshinori  

#### 4:20 (I) CCA-1199

**A Study of Longitudinal Flight Maneuvers for the CTOL Aircraft Model**

- Al-Hiddabi, Saif A.,  
- McClamroch, N. Harris  

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<th>Time</th>
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<th>Affiliation</th>
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<tr>
<td>4:40</td>
<td>CCA-1205</td>
<td>LPV Controller Design for ALFLEX by Using LMI</td>
<td>Ando, Yoshinori, Tsuge, Hidetaka, Suzuki, Masayuki</td>
<td>Nagoya Univ.</td>
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<tr>
<td>5:00</td>
<td>CCA-1211</td>
<td>Formation Flying Control of Multiple Spacecraft via Graphs, Matrix Inequalities, and Switching</td>
<td>Mesbahi, Mehran, Hadaegh, F.Y.</td>
<td>California Inst. of Tech.</td>
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<tr>
<td>5:20</td>
<td>CCA-1217</td>
<td>Motion Control of Highly-Maneuverable Aircraft</td>
<td>Lyshesviki, Sergey E., Dunipace, Kenneth R., Colgren, Richard D.</td>
<td>Purdue Univ., Indianapolis</td>
</tr>
<tr>
<td>5:40</td>
<td>CCA-1223</td>
<td>The Frequency-Domain Heterogeneous Control Mixer Module Method for Control Reconfiguration</td>
<td>Zhenyu, Yang, Huazhang, Shao, Zongji, Chen</td>
<td>Beijing Univ.</td>
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<tr>
<td>6:00</td>
<td>CCA-1229</td>
<td>High-Performance Direct-Drive Flight Actuators: Advanced Technology Demonstration</td>
<td>Lyshesviki, Sergey E.</td>
<td>Purdue Univ., Indianapolis</td>
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### 1999 IEEE CCA/CACSD

**Wednesday, August 25, 1999**

**CACSD Plenary Presentation**
8:30 - 9:30
Convex Matrix Optimization Problems, with Applications in Control, Signal Processing, and Circuit Design

Boyd, Stephen
Stanford Univ.

Chair: Varga, Andras
DLR Oberpfaffenhofen

**CACSD-WA1**

Chair: Li, Yun
Univ. of Glasgow

Co-chair: Wu, Henry
Univ. of Liverpool
Org.: Li, Yun
Univ. of Glasgow

10:00 (I) CACSD-486
Performance Indices in Evolutionary CACSD Automation with Application to Batch PID Generation
Feng, Wenyuan, Li, Yun
Univ. of Glasgow

10:20 (I) CACSD-492
Genetic Algorithm Enabled Computer-Automated Design of QFT Control Systems
Chen, Wen-Hua, Ballance, Donald J., Feng, Wenyuan, Li, Yun
Univ. of Glasgow

10:40 (I) CACSD-498
Control System Design Automation with Robust Tracking Thumbprint Performance Using a Multi-Objective Evolutionary Algorithm
Tan, K.C., Lee, T.H., Khor, E.F.
Nat. Univ. of Singapore
11:00 (I) CACSD-504
Population-Diversity Based Genetic Algorithm for Fuzzy Control of Synchronous Generators
Univ. of Liverpool, Huazhong Univ. of Sci. & Tech.

11:20 (I) CACSD-510
Parameter Identification of an Induction Machine Using Genetic Algorithms
Huang, K.S.
Guangdong Univ. of Tech.
Kent, W., Wu, Q.H., Turner, D.R.
Univ. of Liverpool

11:40 (I) CACSD-516
Lotka-Volterra Machine for a General Model of Complex Biological Systems
Hirafuji, Masayuki, Tanaka, Kei, Hagan, Scott

CACSD-WA2
Systems Engineering Methods for Powertrain Control Development
Chair: Sivashankar, Shiva
Ford Res. Lab.
Co-chair: Moskwa, John J.
Univ. of Wisconsin-Madison
Org.: Sivashankar, Shiva,
Org.: Butts, Ken
Ford Res. Lab.

10:00 (I) CACSD-557
Using Modern Design Tools to Integrate the Systems Engineering and Software Engineering Processes
Holway, Paul, Michaels, Larry, Quinn, Stan, Santos, Craig
MathWorks, Inc.

10:20 (I) CACSD-563
A Modeling Environment for Production Powertrain Controller Development
Sivashankar, N., Butts, K.
Ford Res. Lab.

10:40 (I) CACSD-569
Implementation Details and Test Results for a Transient Engine Dynamometer and Hardware-In-The-Loop Vehicle Model
Babbitt, Guy R., Moskwa, John J.
Univ. of Wisconsin-Madison

11:00 (I) CACSD-575
Production Intent Rapid Prototyping
Erkkinen, Tom J.
Applied Dynamics Int.

11:20 (I) CACSD-581
Symbolic Verification of Executable Control Specifications
Banphawatthanarak, Chonlawit, Krogh, Bruce H.
Carnegie Mellon Univ.
Butts, Ken
Ford Res. Lab.

11:40 (I) CACSD-587
Automated Test of ECUs in a Hardware-In-The-Loop Simulation Environment
Boot, Rolf
AUDI AG
Richert, Jobst, Schuette, Herbert
dSpace GmbH
Ruekgauer, Andreas
dSpace Inc.

CCA-WA3
Chemical and Biological Processes
Chair: Chen, Shih-Chin
ABB Ind. Sys. Inc.
Co-chair: Femat, Ricardo
UASLP

10:00 CCA-1272
Implementing Supervisory Control for Chemical Batch Process
Akesson, K., Fabian, Martin
Chalmers Univ. of Tech.

10:20 CCA-1278
Transition Control of Paper-Making Processes: Paper Grade Change
Murphy, Timothy F., Chen, Shih-Chin
ABB Ind. Sys., Inc.

10:40 CCA-1284
A Simple Method for Oscillation Diagnosis in Process Control Loops
Horch, Alexander
Royal Inst. of Tech.

11:00 CCA-1290
Blood Glucose Regulation: An Output Feedback Approach
Femat, Ricardo, Ruiz-Velazquez, E.
UASLP

11:20 CCA-1294
A Control Relevant Dynamic Model of Grate Sintering
Martinsen, Frode, Foss, Bjarne A., Johansen, Tor Arne
Norwegian Univ. of Sci. & Tech.

11:40 CCA-1300
Optimized Modeling of the Intra Myocardial Coronary Circulation.
Hirayama, H.
Asahikawa medical college
Okizaki, A.
Asahikawa Medical College
Okita, T.
Shizuoka Univ.
Nishimura, T.
Ohita Univ.
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<tr>
<td>12:00</td>
<td>CCA-1306</td>
<td>Adaptive Control of Peristaltic Pumps During Continuous Venovenous Hemofiltration</td>
<td>Morales, Efrain O., Polycarpou, Marios, Hemasilpin, Nat, Bissler, John J.</td>
<td>Univ. of Cincinnati</td>
</tr>
<tr>
<td>10:40</td>
<td>CCA-1318</td>
<td>Scale Transform Approach for Impulse Responses Identification</td>
<td>Zhang, J., Zhang, Jie, Mao, Jianqin</td>
<td>Beijing Univ.</td>
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<tr>
<td>11:40</td>
<td>CCA-1336</td>
<td>Selection and Performance of Probabilistic Tables Used in Non-Model Based Signal Prediction</td>
<td>Zeceña, Juan Carlos Cordova, Yaz, Edwin E.</td>
<td>Univ. of Arkansas</td>
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<td>12:00</td>
<td>CCA-1342</td>
<td>Analysis of α-β-γ Filters</td>
<td>Tenne, Dirk, Singh, Tarunraj</td>
<td>State Univ. of New York at Buffalo, State Univ. of New York</td>
</tr>
<tr>
<td>10:00</td>
<td>CCA-1348</td>
<td>Control Problems in Heavy-Duty Vehicles</td>
<td>Chair: Canudas de Wit, Carlos Co-chair: Tomizuka, M. Org.: Canudas de Wit, Carlos</td>
<td>Lab. d'Autom. de Grenoble, Univ. of California, Berkeley, Lab. d'Autom. de Grenoble</td>
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<tr>
<td>10:20</td>
<td>CCA-1353</td>
<td>Longitudinal and Lateral Control of Heavy-Duty Trucks for Automated Vehicle Following in Mixed Traffic: Experimental Results from the CHAUFFEUR Project</td>
<td>Fritz, Hans</td>
<td>Daimler Chrysler AG</td>
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<td>10:40</td>
<td>CCA-1359</td>
<td>Automated Lane Guidance of Commercial Vehicles</td>
<td>Tomizuka, M., Tai, M., Wang, J-Y., Hingwe, P.</td>
<td>Univ. of California, Berkeley</td>
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<td>11:00</td>
<td>CCA-1365</td>
<td>Modeling and Robust Control of Power Steering System of Heavy Vehicles for AHS</td>
<td>Hingwe, P., Tai, M., Tomizuka, M.</td>
<td>Univ. of California, Berkeley</td>
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<td>11:20</td>
<td>CCA-1371</td>
<td>Stability Analysis via Passivity of the Lateral Actuator Dynamics of a Heavy Vehicle</td>
<td>Canudas de Wit, Carlos, Claey, Xavier Bechart, Hubert</td>
<td>Lab. d'Autom. de Grenoble, Renault Dir. de la Recherche</td>
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CCA-WA5

Chair: Canudas de Wit, Carlos Lab. d'Autom. de Grenoble
Co-chair: Tomizuka, M. Univ. of California, Berkeley
Org.: Canudas de Wit, Carlos Lab. d'Autom. de Grenoble

10:00 (I) CCA-1348
Longitudinal and Lateral Control of Heavy-Duty Trucks for Automated Vehicle Following in Mixed Traffic: Experimental Results from the CHAUFFEUR Project
Fritz, Hans
Daimler Chrysler AG

10:40 (I) CCA-1353
Speed Control Experiments with an Automated Heavy Vehicle
Tan, Yaolong, Robotis, Andreas, Kanellakopoulos, Ioannis
UCLA

11:00 (I) CCA-1359
Automated Lane Guidance of Commercial Vehicles
Tomizuka, M., Tai, M., Wang, J-Y., Hingwe, P.
Univ. of California, Berkeley

11:20 (I) CCA-1371
Stability Analysis via Passivity of the Lateral Actuator Dynamics of a Heavy Vehicle
Canudas de Wit, Carlos, Claey, Xavier Bechart, Hubert
Lab. d'Autom. de Grenoble, Renault Dir. de la Recherche

11:40 (I) CCA-1377
Stability Issues for Vehicle Platooning in Automated Highway Systems
Canudas de Wit, Carlos, Brogliato, Bernard
Lab. d'Autom. de Grenoble
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<th>Institutions</th>
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<tr>
<td>10:00</td>
<td>CCA-1383</td>
<td>Global Stabilization of Centrifugal Compressors via Stability-Based Switching Controllers</td>
<td>Leonessa, Alexander, Haddad, Wassim M., Li, Hua</td>
<td>Georgia Inst. of Tech.</td>
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<td>10:40</td>
<td>CCA-1394</td>
<td>Binary Excitation Based System Identification for Precision Ballscrew Table</td>
<td>Huang, Pai-Yi, Chen, Yung-Yaw</td>
<td>Nat. Taiwan Univ.</td>
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<td>11:00</td>
<td>CCA-1400</td>
<td>Special-Purpose Devices Using Techniques of Discontinuous Control and Setting Adjustment (DC &amp; SA) in Control Applications</td>
<td>Mkrtchian, Vardan, Hovakimyan, Aramais, Hunanyan, Armen, Khachaturyan, Tigran</td>
<td>State Engr. Univ. of Armenia</td>
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<td>12:00</td>
<td>CCA-1418</td>
<td>On the States and Parameters Estimation of Non-Linear Discrete-Time Systems. Design and Experimental Results</td>
<td>Boutayeb, M., Aubry, D., Darouach, M., E., Richard</td>
<td>Univ. of Henri Poincare, INRIA-Lorraine</td>
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<td>2:20</td>
<td>CACSD-528</td>
<td>Software-Enabled Control for Intelligent UAVs</td>
<td>Schrage, Daniel P., Vachtsevanos, George</td>
<td>Georgia Inst. of Tech.</td>
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<td>2:40</td>
<td>CACSD-533</td>
<td>Fuzzy-Neural Control with Application to a Heating System</td>
<td>Mesbah, Samy, Pang, Grantham</td>
<td>Univ. of Hong Kong</td>
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<td>3:00</td>
<td>CACSD-539</td>
<td>The SAL Interpreter for Large-Scale Optimization in Distributed Control Systems</td>
<td>Bailey-Kellogg, Christopher, Zhao, Feng</td>
<td>Dartmouth College, Xerox Palo Alto Res. Cen.</td>
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<td>3:40</td>
<td>CACSD-551</td>
<td>A Learning Algorithm for Recurrent Neural Networks and its Application to Nonlinear Identification</td>
<td>Yamamoto, Yoshihiro, Nikiforuk, Peter N.</td>
<td>Tottori Univ., Univ. of Saskatchewan</td>
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<td>2:00</td>
<td>CACSD-624</td>
<td>SCADA in Hydropower Plants</td>
<td>Mavrin, Mario, Koroman, V., Borovic, B.</td>
<td>Brodarski Inst.</td>
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<td>CACSD-539</td>
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<td>CACSD-624</td>
<td>SCADA in Hydropower Plants</td>
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<td>Brodarski Inst.</td>
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Experience with a MATLAB Toolbox for Multiple-Control Coordination in Large Power Systems
Kamwa, I. Inst. de Recherche d’Hydro-Quebec
Henniche, A. Laval Univ.
Gerin-Lajoie, L., Lefebvre, D. TransEnergie, Hydro-Quebec

Computer-Aided Design of Sliding Mode Control of Permanent Magnet Synchronous Motor
Golea, Amar Biskra Univ.
Golea, Noureddine O.E.B. Univ.
Kadjoudj, Med. Batna Univ.
Benounnes, N. Biskra Univ.

Design of Longitudinal Variable Structure Flight Control System for the F-18 Aircraft Model with Parameter Perturbations
Jafarov, Elbrous M., Tasaltin, Ramazan Istanbul Tech. Univ.

Estimation of Temperature Profiles of Slabs in a Reheat Furnace by Using the Kalman Filter
Koester, Friedhelm Hoesch Spundwand u. Profil GmbH

Conception of Researcher’s Environment for CACSD Gamma-1PC

Fault Detection and Isolation in Dynamical Systems
Chair: Popescu, Theodor Res. Inst. for Inf., Bucharest
Co-chair: Gertler, Janos George Mason Univ.
Org.: Popescu, Theodor Res. Inst. for Inf., Bucharest

Robust Nonlinear Fault Diagnosis: Application to Robotic Systems
Trunov, Alexander, Polycarpou, Marios Univ. of Cincinnati

Diagnostic Reasoning Based on Means-End Models: Experiences and Future Prospects
Larsson, Jan Eric Lund Inst. of Tech.

Fault Diagnosis of the IFAC Benchmark Problem with a Model-Based Recurrent Neural Network
Gan, Chengyu, Danai, Kouros Univ. of Massachusetts

Optimal Auxiliary Input for Fault Detection of Systems with Model Uncertainty
Hatanaka, Toshiharu, Uosaki, Katsuji Tottori Univ.

Detection of Abrupt Changes in Modal Characteristics of a Vibrating Structure -A Case Study
Popescu, Theodor Res. Inst. for Inf., Bucharest

Network and Discrete Event Systems
Chair: Walsh, Gregory C. Univ. of Maryland
Co-chair: Hellgren, Anders Chalmers Univ. of Tech

Asymptotic Behavior of Networked Control Systems
Walsh, Gregory C. Univ. of Maryland
Beldiman, Octavian, Bushnell, Linda Duke Univ.

Impact of Flow Control on Quality of Service Driven Packet Scheduling Disciplines
Hayes, David A., Rumsewicz, Michael Royal Melbourne Inst. of Tech.
Andrew, Lachlan L. H. Univ. of Melbourne

Development of State Space Model and Study of Performance Characteristics of Digital Based Excitation Control System ST4B with Single Machine Connected to Infinite Bus
Rangnekar, Saroj M. A. College of Tech.

Admission Control by MDP Theory: A Single-Sample-Path-Based Approach
Wang, Junjie Univ. of Maryland

Deadlock Detection and Controller Synthesis for Production Systems Using Partial Order Techniques
Hellgren, Anders, Fabian, Martin, Lennartson, Bengt Chalmers Univ. of Tech.

Optimization in Markov Decision Problems with Transition-Dependent Cost Functions
Wang, Junjie Univ. of Maryland
Cao, Xi-Ren Hong Kong Univ. of Sci. & Tech.
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<td>CCA-1484</td>
<td>Modeling and Identification of the Vehicle Suspension Characteristics Using Local Linear Model Trees</td>
<td>Halfmann, Christoph, Nelles, O., Holzmann, H.</td>
<td>Darmstadt Univ. of Tech.</td>
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<td>2:40</td>
<td>CCA-1496</td>
<td>Bilinear Disturbance-Accommodating Optimal Control of Semi-Active Suspension for Automobiles</td>
<td>Yoshida, Kazuo, Okamoto, Bunta</td>
<td>Keio Univ.</td>
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<td>3:00</td>
<td>CCA-1734</td>
<td>Adaptive Nonlinear Control of Repulsive Maglev Suspension Systems</td>
<td>Huang, Chao-Ming, Chen, Min-Shin, Yen, Jia-Yush</td>
<td>Nat. Taiwan Univ.</td>
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<td>3:20</td>
<td>CCA-1502</td>
<td>Active Suspension Control Using a Novel Strut and Active Filtered Feedback: Design and Implementation</td>
<td>Ikenaga, S., Lewis, Frank L., Davis, L., Campos, J., Evans, M., Scully, S.</td>
<td>Univ. of Texas, Arlington</td>
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<td>3:40</td>
<td>CCA-1509</td>
<td>Active Vibration Isolation by Adaptive Control</td>
<td>Shaw, Jinsiang</td>
<td>Huafan Univ.</td>
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<td>2:40</td>
<td>I</td>
<td>Stochastic Perturbation Analysis of Computer Control Systems Subject to Electromagnetic Disturbances</td>
<td>Gray, W. Steven, Gonzalez, Oscar, Dogan, Mustafa</td>
<td>Old Dominion Univ.</td>
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<td>4:20</td>
<td>CCA-1543</td>
<td>Development of nD Control System Toolbox for Use with MATLAB</td>
<td>Xu, Li</td>
<td>Asahi Univ.</td>
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<td>5:00</td>
<td>CCA-1555</td>
<td>A Tool for Rapid System Identification</td>
<td>Wallen, Anders</td>
<td>Lund Inst. of Tech.</td>
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<td>5:20</td>
<td>CCA-1561</td>
<td>Identification Tool for Chemical Processes</td>
<td>Tani, Shigeyuki, Takahashi, Shinsuke, Sekozawa, Teruji</td>
<td>Hitachi Ltd.</td>
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</table>
CCA-WP2
Intelligent Building Control
Chair: Samad, Tariq Honeywell Tech.
Co-chair: So, Albert T.P. City Univ. of Hong Kong
Org.: So, Albert T.P. City Univ. of Hong Kong
4:20 (I) CCA-1579
Development of Air-Conditioning Control Algorithm for Building Energy-Saving
Yamada, Fumio, Yonezawa, Kenzo, Sugawara, Susumu, Nishimura, Nobutaka Toshiba Corp.

4:40 (I) CCA-1585
The Open Protocol Standard for Computerized Building System: BACnet
Haakenstad, Larry K. Alerton Tech., Inc.

5:00 (I) *
A Recipe for Success with Open System
Arnold, Rand Echelon Corp.

5:20 (I) CCA-1744
Creating Better Business Outcomes through Enterprise Integration with Advanced Building Control Solutions
Miller, Daniel T. Honeywell H&BC Solutions & Services

5:40 (I) *
Recent Developments in Controls for Intelligent Buildings
Chow, Billy, Moult, Rob, Purkayastha, David Johnson Controls(HK) Ltd.

6:00 (I) CCA-1591
Dynamic Zoning Based Supervisory Control for Elevators
So, Albert T.P., Yu, Janson K.L., Chan, W.L. City Univ. of Hong Kong Hong Kong Pol. Univ.

CCA-WP3
Control of Communication Networks
Chair: Takano, Makoto NTT Res. and Dev. Cen.
Org.: Takano, Makoto NTT Res. and Dev. Cen.
4:20 (I) * Spot and Derivative Markets in Admission Control: Optimal Seller Strategies
Lazar, Aurel A., Semret, Nemo Columbia Univ.

4:40 (I) CCA-1597
Multi-Attribute Learning Mechanism for Network Control and Management
Inoue, Akiya, Yamamoto, Hisao NTT Service Integration Lab.

5:00 (I) CCA-1603
Stability Analysis of Window-Based Flow Control Mechanism in TCP/IP Networks
Ohsaki, Hiroyuki, Murata, Masayuki, Ushio, Toshimitsu, Miyahara, Hideo Osaka Univ.

5:20 (I) CCA-1607
Towards Efficient Call Admission Control for State-Dependent Routing in Multirate Networks
Ahlfors, Ulf, Korner, Ulf, Pioro, Michal Lund Inst. of Tech.

5:40 (I) CCA-1614
Load Balancing and Control for Distributed World Wide Web Servers
Castro, Maurice, Dwyer, Michael, Rumsewicz, Michael Royal Melbourne Inst. of Tech.

6:00 (I) CCA-1620
Distributed Web Caching Using Hash-Based Query Caching Method
Asaka, Takuya Waseda Univ. Miwa, Hiroyoshi NTT Service Integration Lab. Tanaka, Yoshiaki Waseda Univ.

CCA-WP4
Manufacturing Systems
Chair: De Keyser, Robin Univ. of Gent
Co-chair: Takahashi, Katsuhiro Hiroshima Univ.
4:20 (I) CCA-1626
Robust Output High-Gain Feedback Controllers for the Atomic Force Microscope under High Data Sampling Rate
Hsu, Su-Hau, Fu, Li-Chen Nat. Taiwan Univ.
4:40 CCA-1632
Simulation-Based Planning and Control of Production Fractals
Sihn, Wilfried, Lickefett, M., Pirron, Joerg
Fraunhofer Inst. For Manufac.

5:00 CCA-1636
Model Based Predictive Control in RTP Semiconductor Manufacturing
De Keyser, Robin Donald, Ill, James
Univ. of Gent ASM America Inc.

5:20 CCA-1642
Development of a Robot Holon Using an Open Modular Controller
Schnell, Jakob, Andersen, Soren, Langer, Gilad, Sorensen, Christian
Tech. Univ. of Denmark

5:40 CCA-1648
Applying a Neural Network to the Adaptive Control for JIT Production Systems
Takahashi, Katsuhiro, Nakamura, Nobuto
Hiroshima Univ.

6:00 CCA-1654
Control of Liquid Slosh in an Industrial Packaging Machine
Grundelius, Mattias, Bernhardsson, Bo
Lund Inst. of Tech.

CCA-WP5
Nonlinear and Gain Scheduled Vehicles Control
Chair: Tseng, H.E. Ford Motor Co.
Co-chair: Ono, Eiichi Toyota Central R & D Labs.

4:20 CCA-1660
Technical Challenges in the Development of Vehicle Stability Control System
Tseng, H.E. Madau, D., Ashrafi, B. Brown, T. Recker, D.

4:40 CCA-1667
Tracking Control of Vehicles Using Nonlinear Model
Kobayashi, Tomoaki Ohtsuka, Toshiyuki
Univ. of Tsukuba Osaka Univ.

5:00 CCA-1673
Trajectory Control of an Articulated Vehicle with Tripe Trailers
Tanaka, Kazuo, Taniguchi, Tadanari Wang, Hua O.
Univ. of Electro-Communications Duke Univ.

5:20 CCA-1679
Robust Stabilization of the Vehicle Dynamics by Gain-Scheduled $H_{\infty}$ Control
Ono, Eiichi Hosoe, Shigeyuki Asano, Katsuhiro Sugai, Masaru Doi, Shun’ichi
Toyota Central R & D Labs. Nagoya Univ. Toyota Central R & D Labs.

5:40 CCA-1686
Parallel Parking Car-Like Robot Using Fuzzy Gain Scheduling
Lian, Kuang-Yow, Chiu, Chian-Song, Chiang, Tung-Sheng
Chung-Yuan Christian Univ.

6:00 CCA-1692
Stop & Go Controller for Adaptive Cruise Control
Persson, Mikael Botling, Fredrik, Hesslow, Erik Johansson, Rolf

CCA-WP6
Mechatronics II
Chair: Nishimura, Hidekazu Chiba Univ.
Co-chair: Canuto, Enrico Pol. di Torino

4:20 CCA-1698
Gain-Scheduled Control of a System with Input Constraint by Suppression of Input Derivatives
Nishimura, Hidekazu, Takagi, Kiyoshi, Yamamoto, Kohei
Chiba Univ.

4:40 CCA-1704
Active Distance Stabilization of Large Bodies with Picometer Repeatability
Canuto, Enrico, Donati, Francesco Bertinetto, Fabrizio, Mana, Giovanni
Pol. di Torino Ist. Metrolog. Gustavo Colonnetti Bisi, Marco, Cesare, Stefano, Pepe, Stefano
Alenia Aerospazio

5:00 CCA-1710
A Supervisory Fuzzy Neural Network Controller for Slider-Crank Mechanism
Lin, Faa-Jeng, Fung, Rong-Fong, Lin, Hsin-Hai, Hong, Chih-Ming
Chung Yuan Christian Univ.
CCA Plenary Presentation
8:30 - 9:30
Control in the Automotive Industry:
Accomplishments in the Twentieth Century,
Challenges in the Twenty-First Century
Winkelman, James Ford Motor Co.
Chair: Kanellakopoulos, Ioannis UCLA

CCA-ThA1
Flexible Structures
Chair: Looze, Douglas P. Univ. of Massachusetts
Co-chair: Kobayashi, Nobuyuki Aoyama Gakuin Univ.
10:00 CCA-291 Compensator Design for the ALFA Adaptive Optics System
Looze, Douglas P., Beker, Orhan Univ. of Massachusetts
Kaspar, Markus Max Planck Inst. fur Astronom.
Hippler, Stephan

10:20 CCA-297 Vibration Suppression Control of Flexible Robot Arm with CMS Modeling and Output Feedback Sliding Mode Controller
Kobayashi, Nobuyuki Aoyama Gakuin Univ.
Inoue, Kengo

10:40 CCA-303 Fault-Tolerant Decentralized Control for Large Space Structures
Kobayashi, Yohji Kobe City College of Tech.
Ikeda, Masao Osaka Univ.
Fujisaki, Yasumasa Kobe Univ.

CCA-ThA2a
Scaled Control Experiments
Chair: Alleyne, Andrew Univ. of Illinois, Urbana-Champaign
Org.: Alleyne, Andrew Univ. of Illinois, Urbana-Champaign
10:00 (I) CCA-327 A Scaled Testbed for Vehicle Control: The IRS
Brennan, S., Alleyne, A. Univ. of Illinois, Urbana-Champaign

10:20 (I) CCA-333 The University of Toronto RC Helicopter: A Test Bed for Nonlinear Control
Bortoff, Scott A. Univ. of Toronto

10:40 (I) CCA-339 Implications of Control-Structure Interaction in the Scaled Structural Control System Testing
Dyke, Shirley J., Jansen, Laura M. Washington Univ.

11:00 (I) CCA-345 A Testbed for Nonlinear Flight Control Techniques: The Caltech Ducted Fan
Milam, Mark, Murray, Richard M. California Inst. of Tech.

CCA-ThA2b
Chemical Process Control
Chair: Seborg, Dale E. Univ. of California, Santa Barbara
11:40 CCA-352 Plantwide Control Design and Analysis of a Continuous Polymerization Process Using Optimal Control Methods
Robinson, Derek L., Schnelle, Phillip D. E.I. DuPont de Nemours & Co.
McAvoy, Thomas Univ. of Maryland
### CCA-ThA3

**Control of Chemical Processes II**

Chair: Erickson, Mark
Co-chair: Leonessa, Alexander

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<td>CCA-383</td>
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### CCA-ThA4

**Fuzzy & Neural Network**

Chair: Danai, Kourosh
Co-chair: Kiji, Junichi

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<td>CCA-432</td>
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<td>12:00</td>
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### CCA-ThA5

**Control of Automotive Systems**

Chair: Sun, Jing
Co-chair: Cook, Jeffrey A.
Org.: Sun, Jing
Org.: Cook, Jeffrey A.

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*CCA-359*

Automatic Detection of Excessively Oscillatory Feedback Control Loops
Miao, Tina, Seborg, Dale E.
Univ. of California, Santa Barbara

*CCA-ThA3*

Control of Chemical Processes II
Chair: Erickson, Mark
Co-chair: Leonessa, Alexander

Design of a Decentralized Output Feedback Control Law by Solving a Linear Least Squares Problem
Seatzu, Carla
Univ. of Cagliari

Pressure Feedback Reduced-Order Dynamic Compensation for Axial Flow Compression Systems
Haddad, Wassim M., Corrado, Joseph R., Leonessa, Alexander
Georgia Inst. of Tech.

Bifurcation Control of Rayleigh-Benard Convection
Chen, Dong,
Wang, Hua O.,
Howle, Laurens E.
Duke Univ.

Rapid Process Recipe Optimization for Batch Thermal Reactors
Erickson, Mark A., Shah, S.,
Gudmundsson, T., Pandey, P.
Voyan Tech.

Towards Delta Domain in Predictive Control-An Application to the Space Crystal Furnace TITUS
Ebert, Wolfram
Humboldt-Univ. of Berlin

Operation and Control of a Semibatch Reactive Distillation Column
Fernholz, Gregor,
Wang, Wei,
Engell, Sebastian,
Fouger, Kajsa,
Bred hoses, Jan-Peter
Univ. of Dortmund

Robust LQ Optimal Controller Designing for Refining Process
Xue, Anke,
Lu, Yingquan,
Sun, Youxian
Zhejiang Univ.

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*CCA-391*

Adjustment Rule Generation for Static Systems
Kiji, Junichi
Toshiba Corp.

New Robust and Optimal Designs for Takagi-Sugeno Fuzzy Control Systems
Tanaka, Kazuo,
Hori, Tsuyoshi
Univ. of Electro-Communications
Wang, Hua O.
Duke Univ.

Fuzzy-Logic-Based Guidance Law Design for Missile Systems
Lin, Chih-Min,
Mon, Yi-Jen
Yuan-Ze Univ.

Neural Network Assisted Control Loop Tuner
Wojsznis, Willy K.,
Blevins, Terry L.,
Thiele, Dirk
Fisher-Rosemount Systems

FEP Learning Algorithm: Application to Direct Self-Learning Control
Mendil, Boubekeur
Univ. of Bejaia
Bemhammed, Khier
Univ. of Setif

Model-Based Recurrent Neural Network for Modeling Nonlinear Dynamic Systems
Gan, Chengyu,
Danai, Kourosh
Univ. of Massachusetts

Feedforward IIR Active Noise Control Using Genetic Algorithm
Kim, Jong Boo
Induk Inst. of Tech.
Lee, Tae Pyo
Hyundai Motors Co.
Yim, Kook Hyun
Taesan Precision co.

---

*CCA-403*

Robust LQ Optimal Controller Designing for Refining Process
Xue, Anke,
Lu, Yingquan,
Sun, Youxian
Zhejiang Univ.

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*CCA-442*

Force Tracking Control for Active Suspensions-Theory and Experiments
Chantranuwathana, Supavut,
Peng, Huei
Univ. of Michigan
10:20 (I) CCA-448
Modeling, Performance Analysis and Control Design of a Hybrid Sport-Utility Vehicle

Brahma, Avra, Glenn, Bradley, Guezenne, Yann, Miller, Troy, Rizzoni, Giorgio, Washington, Gregory
Ohio State Univ.

10:40 (I) CCA-454
Improving Turbocharged Diesel Engine Operation with Turbo Power Assist System

Kolmanovsky, Ilya, Stefanopoulou, A.G., Powell, B.K.
Ford Res. Lab. Univ. of California, Santa Barbara

11:00 (I) CCA-460
In-Cylinder Measurement for Engine Cold Start Control

Tunestal, Per, Wilcutts, Mark, Lee, Albert T., Hedrick, J. Karl
Univ. of California, Berkeley

11:20 (I) CCA-465
Multivariable Controller Structure in a Variable Cam Timing Engine with Electronic Throttle and Torque Feedback

Hsieh, Stephen C., Freudenberg, James S., Stefanopoulou, Anna G.
Univ. of Michigan Univ. of California, Santa Barbara

11:40 (I) CCA-471
Modeling and Control of Gasoline Direct Injection Stratified Charge (DISC) Engines

Sun, Jing, Kolmanovsky, Ilya, Brehob, Diana, Cook, Jeffrey A., Buckland, Julie, Haghgooie, Mo
Ford Res. Lab.

10:40 CCA-490
Biologically Inspired Adaptive Dynamic Walking of the Quadruped on Irregular Terrain

Fukuoka, Yasuhiro, Nakamura, Hiroyuki, Kimura, Hiroshi
Univ. of Electro-Communications

11:00 CCA-496
Analysis and Design of Running Robots in Touchdown Phase

Ikeda, Takayuki, Iwatani, Yasushi, Suse, Koichi, Mita, Tsutomu
Tokyo Inst. of Tech.

11:20 CCA-502
Control and Analysis of the Gait of Snake Robots

Prautsch, P., Mita, T.
Tokyo Inst. of Tech.

11:40 CCA-508
Dynamic Modeling of Flexure Jointed Hexapods for Control Purposes

McInroy, John E.
Univ. of Wyoming

CCA-ThM1
Vibration Control and Input Shaping
Co-chair: Tagawa, Yasutaka Tokyo Univ. of Agric. & Tech.

2:00 CCA-514
Estimation and Control of Vibrations of Circular Saws

Wang, Xiaochun G., Xi, Fengfeng Jeff, Li, Daming, Qin, Zhong

2:20 CCA-521
New Simple Adaptive Control Subject to Disturbances and Application to Torsional Vibrational Suppression

Mine, M., Date, K., Ohmori, Hiromitsu, Sano, A.
Keio Univ.

Todaka, Yuji, Nishida, Hideyuki
Fuji Electric. Co.

3:00 CCA-533
Vibration Reduction with Specified-Swing Input Shapers

Singhose, William, Mills, Bart, Seering, Warren
Georgia Inst. of Tech., Massachusetts Inst. of Tech.
Input Shaper Design for Double-Pendulum Planar Gantry Cranes
Kenison, Michael, Georgia Inst. of Tech.
Singhose, William

Limiting Excitation of Unmodeled High Modes with Negative Input Shapers
Singhose, William, Georgia Inst. of Tech.
Grosser, Karen

CCA-ThM2
Robust and Nonlinear Control of Magnetic Bearings
Chair: Fujita, Masayuki Kanazawa Univ.
Co-chair: Knospe, Carl R. Univ. of Virginia
Org.: Fujita, Masayuki Kanazawa Univ.

Magnetic Suspension and Vibration Control of Beams for Non-Contact Processing
Trumper, David L., Massachusetts Inst. of Tech.
Weng, Ming-chih,
Ritter, Robert J.

Sliding Mode Nonlinear Control of Magnetic Bearings
Torres, Mauricio C.N.R.S.
Sira-Ramirez, Hebertt CINVESTAV-IPN
Escobar, Gerardo C.N.R.S.

Uncertain Model and Mu-Synthesis of a Magnetic Bearing
Namerikawa, Toru, Kanazawa Univ.
Fujita, Masayuki

Low-Order Mu-Synthesis Controller Design for a Large Boiler Feed Pump Equipped with Active Magnetic Bearings
Losch, Florian Int. Cen. for Magnetic Bearings
Gähler, Conrad MECOS Traxler
Herzog, Raoul

Mu-Control of a High Speed Spindle Thrust Magnetic Bearing
Fittro, Roger L. Aston Univ.
Knospe, Carl R. Univ. of Virginia

Adaptive Unbalance Vibration Control of Magnetic Bearing System Using Frequency Estimation for Multiple Periodic Disturbances with Noise
Nonami, Kenzo, Chiba Univ.
Liu, Zi-he

CCA-ThM3
Process Control
Chair: Takatsu, Haruo Yokogawa Electric Corp.
Co-chair: Samad, Tariq Honeywell Tech.
Org.: Shigemasa, Takashi Toshiba Co.

Adaptive Fuzzy Temperature Control for Hydronic Heating Systems
Haissig, Christine M. Honeywell Tech. Cen.

Auto-Tuning PID Using Loop Shaping Ideas
Dash, Sachi,
Stein, Gunter

Exapilot, Operational Efficiency Increase Support Package
Kobayashi, Yasunori,
Takatsu, Haruo Yokogawa Electric Corp.

A Comparison of Identification-Based Performance Bounds for Robust Process Control
Adusumilli, S. Arizona State Univ.
Rivera, D.E., Arizona State Univ.
Tsakalis, K.

An Optimizing Control for District Heating and Cooling Plant
Murai, Masahiko Toshiba Corp.
Sakamoto, Yoshiyuki,
Shinozaki, Tsutomu

Impacts of Enterprise Wide Supply-Chain Management Techniques on Process Control
Tjoa, I. Bhieng, MC Res. & Innovation Cen.
Raman, Ramesh
Itou, Toshiaki,
Fujita, Kaoru,
Natori, Yukikazu Mitsubishi Chem. Corp.

CCA-ThM4
Power Systems Control I
Chair: Bevrani, Hassan West Reg. Elec. Cc
Co-chair: Owens, David H. Univ. of Exeter

Nonlinear Control of Non-Minimum Phase Systems: Application to the Voltage and Speed Regulation of Power Systems
Okou, Aime Francis,
Akhrif, Ouassima,
Dessaint, Louis-A. École de Tech. Superieure
Robust Load Frequency Controller in a Deregulated Environment: A Mu-Synthesis Approach
Bevrani, Hassan
West Regional Electric Co.

Fuzzy Logic in Voltage and Reactive Power Control in Power Systems
Catholic Univ. of Minas Gerais, Parana State Energy Co.

Stability Analysis of the International Space Station Electrical Power System
Ly, J.H., Truong, C.
Aerospace Corp.

Robust Control of Gas Generator in a 1.5 MW Gas Turbine Engine
Gomma, H. W., Owens, David H.
Univ. of Exeter

Unsupervised Neural Network for Fault Detection and Classification in Dynamic Systems
Pei, Xiaojin, Chowdhury, Fahmida N.
Univ. of Southwestern Louisiana

Design of a State Control for a Solid-Coupled Magnetic Levitation Transport System
Groning, Ingolf, Zickermann, Richard, Henneberger, Gerhard
Aachen Inst. of Tech.

Road Friction Estimation Using Adaptive Observer with Periodical Sigma-Modification
Nishirai, Hikaru, Kawabe, Taketoshi, Shin, Seilichi
Univ. of Tokyo

Chair: Singh, Tarunraj SUNY at Buffalo
Co-chair: Groning, Ingolf RWTH

A Sliding Mode Nonlinear Control Strategy for Anti-Lock Braking Systems
Taheri, Saied
Amirkabir Univ. of Tech.

Adaptive Fuzzy Logic Control of an Anti-Locking Braking System
Kokes, Guy, Singh, Tarunraj
SUNY at Buffalo

Hardware-In-The Loop Simulator for ABS/TCS
Lee, Jae-Cheon, Suh, Myung-Won
Keimyung Univ., Sung-Kyun-Kwan Univ.

Unfalsified Direct Adaptive Control of a Two-Link Robot Arm
Tsao, Tung-Ching, Safonov, Michael G.
Spectrum Astro, Inc. Purdue Univ., Indianapolis

Design of Nonlinear Tracking Controllers for Robots
Lysheski, Sergey E., Sinha, A.S.C., Rizkalla, Maher
Purdue Univ., Indianapolis

RD500 Manipulator Force Controller Design: A Multiobjective Approach
Folcher, Jean-Pierre École Nat. Superieure de Tech. Avan. Andriot, Claude Commisariat a l`Energie Atomique

Performance Improvement of Direct Gradient Descent Control for General Nonlinear Systems
Shimizu, K., Otsuka, K.
Keio Univ.
CCA-ThP1

Motion and Vibration Control via Command Shaping
Chair: Meckl, Peter H. Purdue Univ.
Co-chair: Singhose, William Georgia Tech.
Org.: Meckl, Peter H. Purdue Univ.

4:20 (I) CCA-707
Benchmarking Optimal Control Strategies for Flexible Systems
Reynolds, Michael C., Meckl, Peter H. Purdue Univ.

4:40 (I) CCA-713
An Expert System for the Design of Input Shapers
French, Lila Massachusetts Inst. of Tech.
Singhose, William Georgia Inst. of Tech.
Seering, Warren Massachusetts Inst. of Tech.

5:00 (I) CCA-719
Comparison of Command Shaping Controllers for Suppressing Payload Sway in a Rotary Boom Crane
Lewis, Derek Seagate Tech.
Parker, Gordon G. Michigan Tech. Univ.
Driessen, Brian, Robinett, Rush D. Sandia Nat. Lab.

5:20 (I) CCA-1774
Command Shaping Boom Crane Control System with Nonlinear Inputs
Parker, Gordon G. Michigan Tech. Univ.
Groom, Kenneth, Hurtado, Johnny, Robinett, Rush D.
Leban, Frank Naval Surface Warfare Cen.

CCA-ThP2

Control of Magnetic Bearings and Steppers
Chair: Wang, Y. California Inst. of Tech.
Co-chair: Torres, Mauricio CNRS

4:40 (I) CCA-737
Elimination of Imbalance Vibrations in Magnetic Bearing Systems Using Discrete-Time Gain-Scheduled Q-Parameterization Controllers

CCA-ThP3

Control of Semiconductor Manufacturing Processes
Chair: Smith, Roy Univ. of California, Santa Barbara
Co-chair: Poolla, Kameshwar Univ. of California, Berkeley
Org.: Smith, Roy Univ. of California, Santa Barbara

4:20 (I) CCA-761
Control of a III-V Epitaxial MOCVD Process Using Ultraviolet Absorption Concentration Monitoring
Gaffney Flynn, Monique S. Litton Guid. & Cont. Sys.
Smith, Roy, Abraham, Patrick, DenBaars, Steven P. Univ. of California, Santa Barbara

4:40 (I) CCA-767
Piloting Epitaxy through Ellipsometric Feedback
Warnick, Sean C., Dahleh, Munther A. Massachusetts Inst. of Tech.

5:00 (I) CCA-773
Real-Time Estimation of Patterned Wafer Parameters Using In-Situ Spectroscopic Ellipsometry
Galarza, Cecilia G., Khargonekar, Pramod P., Terry, Jr, Fred L. Univ. of Michigan

5:20 (I) CCA-779
Real-Time Plasma Etch Control Using In-Situ Sensors and Neural Networks
Stokes, David, May, Gary S. Georgia Inst. of Tech.

CCA-ThP4

Milled Elements

Chair: Wang, Y. California Inst. of Tech.
Co-chair: Torres, Mauricio CNRS

4:40 (I) CCA-784
Micro-Sensor Arrays for Calibration, Control, and Monitoring of Semiconductor Manufacturing Processes
Fisher, Darin, Freed, Mason, Spanos, Costas, Pooolla, Kameshwar Univ. of California, Berkeley
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<td>6:00</td>
<td>CCA-789</td>
<td>Interprocess Run-To-Run Feedforward Control for Wafer Patterning</td>
<td>Wagner, Aaron B. (Univ. of Michigan) Ruegoegger, Steven M. (IBM) Freudenberg, James S. (Univ. of Michigan) Grimard, Dennis S. (Univ. of Michigan)</td>
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<td>CCA-796</td>
<td>Emulating Large, Time Varying Rotary Power Loads At Low Cost</td>
<td>McInroy, John E. (Univ. of Wyoming) Legowski, S.F. (Univ. of Wyoming) Morris, C.M. (Univ. of Wyoming) Muknahallipatna, S. (Univ. of Wyoming) Bershinsky, V. (Univ. of Wyoming)</td>
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<td>CCA-802</td>
<td>Robust Controller Design for Simultaneous Control of Throttle Pressure and Megawatt Output in a Power Plant Unit</td>
<td>Zhao, Haipeng (Univ. of Illinois at Urbana-Champaign) Li, Wei (Univ. of Illinois, Urbana-Champaign) Taft, Cyrus (EPRI I&amp;C Cen.) Bentsman, Joseph (Univ. of Illinois, Urbana-Champaign)</td>
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<td>CCA-808</td>
<td>Nonlinear and Linear Robust Control of Switching Power Converters</td>
<td>Bevrani, Hassan (West Regional Electric Co.) Abrishamchian, M. (K.N. Toosi Univ. of Tech.) Sarari-shad, N. (K.N. Toosi Univ. of Tech.)</td>
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<td>CCA-814</td>
<td>Nonlinear Variable Speed Control of Wind Turbines</td>
<td>Song, Y.D. (North Carolina A&amp;T State Univ.) Dhinakaran, B. (North Carolina A&amp;T State Univ.)</td>
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<td>CCA-820</td>
<td>Reduced-Order Estimation of Power System Harmonics Using Set Theory</td>
<td>Andreou, Spyros (Univ. of Arkansas) Yaz, Edwin E. (University of Central Florida) Olejniczak, Kraig J. (University of Central Florida) Yaz, Yvonne like (Centenary College)</td>
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<td>Optimization-Based Tuning and Coordination of Flexible Damping Controllers for Bulk Power Systems</td>
<td>Kamwa, I. (Inst. de Recherche d'Hydro-Quebec) Trudel, G. (TransEnergie, Hydro-Quebec) Lefebvre, D. (TransEnergie, Hydro-Quebec)</td>
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**CCA-ThP5**

**Automotive Control**

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<td>4:20</td>
<td>CCA-833</td>
<td>Optimization of Complex Powertrain Systems for Fuel Economy and Emissions</td>
<td>Kolmanovsky, Ilya (Ford Res. Lab.) van Nieuwstadt, Michiel (Ford Res. Lab.) Sun, Jing (Ford Res. Lab.)</td>
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<td>CCA-840</td>
<td>Diesel-Electric Drivetrains for Hybrid-Electric Vehicles: New Challenging Problems in Multivariable Analysis and Control</td>
<td>Lyshchevski, Sergey E. (Purdue Univ., Indianapolis) Schmidt, Martin (Darmstadt Univ. of Tech.) Kessel, Jens-Achim (Darmstadt Univ. of Tech.)</td>
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<td>CCA-846</td>
<td>Automation Concept for a New Dynamical Engine Test Stand</td>
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<td>CCA-858</td>
<td>Nonlinear Analysis and Control of Turbocharged Diesels</td>
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**CCA-ThP6**

**Robot Manipulators**

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<td>CCA-863</td>
<td>Lyapunov Recursive Design of Robust Tracking Control with L2-Gain Performance for Electrically-Driven Robot Manipulators</td>
<td>Ishii, Chiharu (Ashikaga Inst. of Tech.) Shen, Tielong (Sophia Univ.) Qu, Zhuhua (Univ. of Central Florida)</td>
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<td>CCA-869</td>
<td>Decentralized Control of Cooperative Manipulators Based on Virtual Force Transmission Algorithm</td>
<td>Itoh, Masanao (Keio Univ.) Murakami, Toshiyuki (Keio Univ.) Ohnishi, Kouhei (Keio Univ.)</td>
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5:00 CCA-875
Robust Adaptive Friction Compensation for Tracking Control of Robots
Tomei, Patrizio Univ. of Roma

5:20 CCA-881
Robust Output Feedback Control of Robot Manipulators Using High-Gain Observer
Shin, Eui Seok, Lee, Kang Woong Hankuk Aviation Univ.

5:40 CCA-887
An Approach to Robust Hierarchical Impedance Control in Redundant Manipulator
Ishii, Kunihiko, Fujimoto, Yasutaka, Murakami, Toshiyuki, Ohnishi, Kouhei Keio Univ.