

2001 International Symposium on Adaptive and Intelligent Systems and Control

University of Virginia, Charlottesville, Virginia, USA

June 28, 2001

Program and Abstracts

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Organizer and Chair: Gang Tao

Department of Electrical and Computer Engineering

School of Engineering and Applied Science

University of Virginia

Charlottesville, VA 22903

2001 International Symposium on Adaptive and Intelligent Systems and Control

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Purpose

As researches in adaptive systems and control and that in intelligent systems and control have experienced tremendous successes in both theory and applications and are developing rapidly with emergence of new encouraging solutions to open challenging problems, this symposium is aimed at acting as an international forum for researchers in these areas to present recent results, discuss new ideas, and expand future directions. The symposium takes place on the day after the 2001 American Control Conference to be held on Monday, June 25 - Wednesday, June 27, 2001, in Arlington, Virginia, USA.

Scope

Any topics in theory and applications of adaptive system and control, and of intelligent systems and control are welcome, including but not limited to:

Adaptive control, adaptive filtering, adaptive signal processing and communications systems, artificial neural networks, computational intelligence, control education, control of distributed parameter systems, control software, dynamic systems modeling, estimation, fault tolerance and detection, fuzzy logic, genetic algorithms, hybrid systems, intelligent automation, intelligent control, intelligent telerobotics, knowledge-based systems, learning systems and control, magnetic bearing systems, modeling and adaptive control of biosystems, multi-agent systems, multi-mode control, neural systems, network theory, nonlinear systems and control, pattern recognition, PID tuning, real-time systems modeling and control, self-organizing systems, sensor and actuator failure compensation, smart material and structures, stability and robustness analysis, switching control, system identification, system simulations.

Plenary Talk

Intelligent Control: Learning and Adaptation in Complex Systems
Professor Kumpati S. Narendra, Yale University

Schedule

Submission of extended abstracts (2 pages): April 20, 2001
Notification of acceptance: May 1, 2001
Conference time: Thursday, June 28, 2001.

Organizer and Chair

Professor Gang Tao
Department of Electrical and Computer Engineering
University of Virginia
Charlottesville, VA 22903, USA

Homepage

<http://www.people.virginia.edu/~gt9s/symp01/symp01.html>

Presentations

<http://www.people.virginia.edu/~gt9s/symp01/pres.html>

Program

<http://www.people.virginia.edu/~gt9s/symp01/prog.pdf>
<http://www.people.virginia.edu/~gt9s/symp01/prog.ps>

Acknowledgements

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Location

City of Charlottesville, where the 1981 Joint Automatic Control Conference was held on University of Virginia's campus, is located in Central Virginia, approximately 100 miles southwest of Washington, D.C. (Arlington, Virginia) and 70 miles northwest of Richmond, Virginia. It is situated at the foothills of the Blue Ridge Mountains and near the Shenandoah National Park, with a local area population 150,000. It is a unique place in the United States that combines a picturesque and cultivated countryside so rich in historical associations with the proximity of a national park and a wide array of cultural opportunities, as named by the Money Magazine in 1998 as a top beautiful and livable city in the US, with many attractions including:

Monticello Home of Thomas Jefferson, third U.S. President, author and founder of the University of Virginia. Ash Lawn-Highland, the home of the fifth U. S. president, James Monroe. University of Virginia, recognized as one of the nation's outstanding universities, as well as a supreme architectural achievement. Montpelier, celebrating the life and legacy of U.S. President Madison, the Father of the Constitution, and Dolley Madison, America's first First Lady.

Skyline Drive and Blue Ridge Parkway meet at the top of the Rockfish Gap, through Shenandoah National Park. Natural Bridge of Virginia, one of the seven natural wonders of the world. Underground Wonders of Virginia: Grand Caverns, Caverns of Natural Bridge, Luray Caverns, Endless Caverns, some of the most popular and beautiful caverns in the US. Tours of museums, battlefields and Jefferson Vineyards near Charlottesville, Buckley Moss Museum, Hall of Valor Civil War Museum, Virginia Museum of Fine Arts, Museum and White House of the Confederacy, Berkeley Plantation (the original Thanksgiving site), and the historic and scenic city of Williamsburg.

Plenary Talk (10:00 – 11:00)

Intelligent Control: Learning and Adaptation in Complex Systems

K. S. Narendra

Session I (11:20 – 1:00)

Adaptive Control Theory (I)

Chair: Shuzhi S. Ge

Adaptive Nonlinear Control with Dynamic Uncertainties

Zhong-Ping Jiang

Direct Adaptive NN Control of a Class of Nonlinear Systems

Shuzhi S. Ge and Cong Wang

Multivariable MRAC Using Nussbaum Gain

Alvaro K. Imai, Ramon R. Costa and Liu Hsu

Adaptive Actuator Failure Compensation Based on MRAC Designs

Shuhao Chen, Gang Tao and Suresh M. Joshi

Adaptive Actuator Failure Compensation for Nonlinear Systems

Xidong Tang, Gang Tao and Suresh M. Joshi

Session II (11:20 – 1:00)

Nonlinear Control Systems

Chair: Zongli Lin

Discrete-time Implementation of High-gain Observers in Nonlinear Feedback Control

Hassan K. Khalil

A Few Recent Results on Control Systems with Actuator Saturation

Tingshu Hu and Zongli Lin

Indirect Passivation: Examples and Feasibility Conditions

Murat Arcak and Petar Kokotovic

Robust Practical Stabilization of Nonlinear Uncertain Plants with Input and Output Nonsmooth Nonlinearities

Maria Letizia Corradini and Giuseppe Orlando

On Friction Compensation Without Friction Model

Mazen Alamir

Session III (2:00 – 3:40)

Adaptive Control Applications

Chair: Chenyang Lu

Adaptive Pulse Control of Electronic Throttle

Carlos Canudas de Wit, Ilya Kolmanovsky and Jing Sun

System Identification and Delay Control in Web Servers

Chenyang Lu, Tarek F. Abdelzaher, John A. Stankovic, Sang H. Son

Adaptive Position and Orientation Regulation for the Camera-in-Hand Problem

P. Setlur, A. Behal, W. Dixon and D. M. Dawson

Adaptive Chatter Suppression in Metal Cutting via Piezoactuator

Jingchuan Pan and Chun-Yi Su

Nonlinear Adaptive SPR Speed Control of Induction Motor with Maximal Power Transfer

Hou-Tsan Lee and Li-Chen Fu

Session IV (2:00 – 3:40)

Intelligent Control

Chair: Stephanie Guerlain

Minimum Entropy Control of Closed Loop Tracking Errors for Dynamic Stochastic Systems

Hong Yue and Hong Wang

Visualizing Model-Based Predictive Controllers

Stephanie Guerlain

Robust Tracking Control for a Class of Modified Duffing Equations

Xing-Gang Yan, I-Ming Chen and Hsi-Shang Li

Electronic Control Strategies for Electrostrictor Actuators

Douglas K. Lindner

Evolutionary Design Scheme of PID Controllers

Toru Yamamoto, Michiyo Suzuki, Yasue Mitsukura and Kazuo Kawada

Session V (4:00 – 5:40)

Adaptive Control Theory (II)

Chair: Avinash Taware

Duality of Identification and Control in Stochastic Adaptive Systems

Nikolai Filatov

Adaptive Neural Network Model Predictive Control for Multiple Variable Nonlinear Systems

Daohang Sha

Variable Structure Recurrent Neural Networks for Nonlinear Identification

Edgar N. Sanchez and Ramon A. Felix

Self-tuning Two-Degree-of Freedom PID Controller Approximating to Generalized Minimum Variance Control with Steady State Predictive Output

Takao Sato, Akira Inoue and Yoichi Hirashima

Adaptive Control of Sandwich Nonlinear Systems

Avinash Taware and Gang Tao

Session VI (4:00 – 6:00)

Intelligent Systems

Chair: Sheng-Guo Wang

USTC GPS Intelligent Vehicle Navigation System

Yuanlu Bao and Sheng-Guo Wang

A Guided Genetic Scheme for the Traveling Salesman Problem

Jose G. Delgado-Frias and Wei Lin

Fitting an Elephant into a Shoebox: Toward High-speed, Flexible Controllers on General Purpose Computers

Marty Humphrey, Kevin Skadron, Bin Huang, Edgar Hilton, Jihao Luo, and Paul Allaire

Pricing Network Services for Congestion Controlled Flows

Enrique Campos Nanez and Stephen D. Patek

Shared Control and Variable Autonomy in Mobility Aids for the Elderly

G. S. Wasson, J. P. Gunderson, B. S. Graves and R. A. Felder

The Study and Design of the Multi-media Computer Simulation System for Major Danger Source Supervision and Precaution

Qingyu Tong and Ying Fan and Bing Li