One-Day Workshop

Recent Advances and Future Directions on Adaptation and Control

Location: Workspring 30 W Monroe, Suite 400 Chicago, IL 60603

Date: June 30th, 2015

Organizers: K. G. Vamvoudakis, S. Jagannathan

Website: http://www.ece.ucsb.edu/~kyriakos/rafdac.html

Sponsored by: Missouri University of Science and Technology

8:00-8:10--*Welcome from the Organizers (S. Jagannathan and K. G. Vamvoudakis)*

Keynote (Chair: Bob Newcomb)

8:10-8:40 **Frank Lewis (UT Arlington, Research Institute)**--*Recent Advances and New Directions in Integral Reinforcement Learning for Feedback Control*

8:40-8:50 Comments by **K. Narendra (Yale)**

8:50-9:00 Break

Session on Adaptive Control, Learning and Future Directions (Co-Chairs: S. Jagannathan and K. G. Vamvoudakis)

9:00-9:20 **K. Narendra (Yale)**--*Hierarchical Adaptive Control of Rapidly Time-Varying Systems*

9:20-9:40 **B. Newcomb (UMD)**--*The Stereographic Product of Positive-Real Functions is Positive-Real*

9:40-10:00 **D. Copp, J. P. Hespanha (UCSB)**--*Addressing Adaptation and Learning in the Context of MPC and MHE*

Session on Adaptive Stabilization and Large-Scale Systems (Co-Chairs: Yorai Wardi, Panos Antsaklis)

10:00-10:20 **W. M. Haddad (GaTech)**--*A Mechanistic Neural Field Theory of How Anesthesia Suppresses Consciousness: Synaptic Drive Dynamics, System Stability, Attractors, Partial Synchronization, and the Anesthetic Cascade*

10:20-10:40 **Y. Wardi, C. Seatzu (GaTech, U. of Cagliari)**--*Performance Regulation in Discrete Event Dynamic Systems*

10:40-11:00 **E. Garcia, P. J. Antsaklis (U. Notre Dame)**--*Adaptive Stabilization of Uncertain Systems with Model-Based Control and Event-triggered Feedback Updates*

11:00-11:20 **T. Parisini, M. Polycarpou (Imperial, U. of Cyprus)**-*Distributed Fault Diagnosis of Large-scale Interconnected Systems*

Session on Reinforcement Learning for Feedback Control I   (Co-Chairs: W. Dixon and Z-P Jiang)

11:20-11:40 **W. Dixon (U. Florida)**--*Model-based Reinforcement Learning for Real-time Approximate Optimal Control*

11:40-12:00 **T. Bian, Z.-P. Jiang (NYU Poly)**--*Stochastic Adaptive Dynamic Programming for Robust Optimal Control Design*

Lunch Break 12:00-12:30

Session on Reinforcement Learning for Feedback Control II   (Co-Chairs: D. Liu and K. G. Vamvoudakis)

12:30-12:50 **D. Liu, H. Li (UIC)**--*Unsupervised Feature Learning for Policy Iteration based on Manifold Regularization*

12:50-1:10 **S. Jagannathan (MST)**--*Adaptive optimal regulation of a class of uncertain nonlinear systems using event sampled neural network approximators*

1:10-1:30 **K. G. Vamvoudakis (UCSB)**--*Model-Free Optimization-Based Algorithms with Applications to Network Security*

Session on Cooperative Control (Co-Chairs: Stjepan Bogdan *and Rafael Fierro)*

1:30-1:50 **D. Tolic, I. Palunko, A. Ivanovic, M. Car, S. Bogdan (U. of Zagreb)**--*Multi-Agent Control in Degraded Communication Environments*

1:50-2:10 **R. Harvey and Z. Qu (UCF)**--*Cooperative Control and Networked Operation of Passivity-Short Systems*

2:10-2:30 **J. Huang (The Chinese University of Hong Kong)**--*Certainty Equivalence, Separation Principle, and Cooperative Output Regulation of Multi-Agent Systems by Distributed Observer Approach*

2:30-2:50 **P. Cruz, R. Fierro, C. Abdallah (UNM)**--*Cooperative Learning for Robust Connectivity in Multi-robot Heterogeneous Networks*

2:50-3:10 **Z. Li (U. Virginia)**--*Discrete-time Coordinated Control of Wheeled Vehicles in the Presence of a Large Communication Delay*

Break 3:10-3:30

Session on Applications of Adaptive Control and Game Theory (Co-Chairs: S. Commuri and R. Malhame)

3:30-3:50 **A. C. Kizilkale R. P. Malhamé (École Polytechnique de Montréal)**--*Control of Aggregate Electric Water Heating Loads via Mean Field Games Based Methods*

3:50-4:10 **Z. Kovacic, G. Vasiljevic, I. Draganjac, T. Petrovic, D. Miklic, F. Petric, S. Bogdan (U. of Zagreb)**--*Estimation and Control for Safe Autonomous Vehicle Navigation in Industrial Warehousing Environments*

4:10-4:30 **A. Mai, S. Commuri (The University of Oklahoma)**--*Intelligent Control of a Prosthetic Ankle using Gait Recognition*

4:30-4:50 **G. Herrmann (Bristol)**--*An Adaptive Algorithm for Robust, Finite time Control and Estimation – Examples in Theory and Practice*

4:50 pm Closing Remarks and Adjourn