



# **First Annual NSF EFRI-MST-GTECH WORKSHOP**

June 8 – 9, 2009

G-31 Emerson Electric Co Hall  
Missouri S&T, Rolla, MO



***First Annual  
NSF EFRI-MST-GTECH WORKSHOP  
Program***

**Monday, June 8, 2009**

- 8:15 am - 8:30 am    **Registration**
- 8:30 am - 8:45 am    Welcome and Opening Remarks  
*Dr. K. Krishnamurthy, Vice Provost for Research - Missouri S&T*
- 8:45 am - 9:00 am    Welcome and Opening Remarks  
*Dr. K. Erickson, Chair: Dept. of Electrical and Computer Engineering - Missouri S&T*
- 9:00 am - 9:15 am    NSF EFRI Project Overview  
*Dr. G. K. Venayagamoorthy - Missouri S&T*
- 9:15 am - 9:40 am    Learning Nonlinear Functions with MLPs and SRNs  
*R. Cleaver and G. K. Venayagamoorthy - Missouri S&T*
- 9:40 am - 10:05 am    Training Simultaneous Recurrent Neural Networks Using the PSO-QI Algorithm to Learn MIMO Systems  
*B. Luitel and G. K. Venayagamoorthy - Missouri S&T*
- 10:05 am - 10:30 am    Voltage Profile Prediction using Cellular Neural Networks  
*L. L. Grant and G. K. Venayagamoorthy - Missouri S&T*
- 10:30 am - 11:00 am    **Coffee Break**
- 11:00 am - 11:25 am    Investigating the Properties of Cellular Simultaneous Recurrent Neural Networks  
*T. H. Kim, X. Sun, and D. C. Wunsch - Missouri S&T*
- 11:25 am - 11:50 am    An Introduction to the Echo State Network (ESN) and its Applications in Power Systems  
*J. Dai, G. K. Venayagamoorthy, and R. G. Harley - Georgia Tech and Missouri S&T*
- 11:50 am - 12:15 pm    Foundations for Training Living Neural Networks to Predict Power Grid Parameters  
*R. Ortman, R. Hooper, W. Soofi, K. Van Antwerp, G. K. Venayagamoorthy and S. M. Potter  
Georgia Tech & Missouri S&T*
- 12:15 pm - 1:15 pm    **Lunch**

## Monday, June 8, 2009

- 1:30 pm - 2:30 pm Cells, ZEDs, and other Smart Grid Innovations  
*Dr. S. Cherian - Spirae*
- 2:30 pm - 2:55 pm Spiking Neural Networks for Identification of Power System Dynamics  
*C. Johnson and G. K. Venayagamoorthy - Missouri S&T*
- 2:55 pm - 3:20 pm Adaptive Critics with Spiking Neural Networks for Applications in Smart Power Grids  
*P. Mitra and G. K. Venayagamoorthy - Missouri S&T*
- 3:20 pm - 3:40 pm **Coffee Break**
- 3:40 pm - 4:05 pm Modeling of Pumped Storage Hydro-Plants and Wind Farms in a Large Power System for Stability Study  
*J. Liang and R. G. Harley - Georgia Tech*
- 4:05 pm - 4:30 pm Real-Time Simulation of V2G Integration  
*K. A. Corzine, G. K. Venayagamoorthy, and C. M. Hutson - Missouri S&T*
- 4:30 pm - 4:55 pm V2G Optimization for Emission and Cost Reductions  
*A. Y. Saber and G. K. Venayagamoorthy - Missouri S&T*
- 4:55 pm - 5:20 pm Cyber Technologies for Shaping the Evolution of Smart Grids  
*G. K. Venayagamoorthy - Missouri S&T*
- 6:30 pm - 8:30 pm **Banquet – Zeno’s Steakhouse**

## Tuesday, June 9, 2009

- 8:30 am - 10:00 am Lab Demos
- 10:00 am - 10:20 am **Coffee Break**
- 10:20 am - 12:15 pm Project Goals and Next Steps 1
- 12:15 pm - 1:15 pm **Lunch**
- 1:30 pm - 3:15 pm Project Goals and Next Steps 2
- 3:15 pm - 3:35 pm **Coffee Break**
- 3:35 pm - 5:45 pm *PI and Co-PIs Discussions*