

Workshop on Wireless Intelligent Sensor Networks (WISeNet)

June 4-5, 2013

PROGRAM

Tuesday, June 4, 2013

6:30-7:00 pm **REGISTRATION**

7:00-9:00 pm **RECEPTION**
(Heavy Hors D'oeuvres will be served)

Hilton Durham Near Duke University
3800 Hillsborough Road, Durham, NC 27705

Wednesday, June 5, 2013

Duke University, Fitzpatrick Center for Interdisciplinary Engineering, Medicine and Applied Sciences (FCIEMAS)

8:30-9:00 am **REGISTRATION & CONTINENTAL BREAKFAST**
FCIEMAS Pre-function Lobby

9:00-9:10 **WELCOME AND OPENING REMARKS**
Silvia Ferrari, IGERT WISeNet Program Director
Paul Ruffin Scarborough Associate Professor of Engineering, Duke University
Schiciano A

9:10-9:50 **KEYNOTE LECTURE**
Sonia Martinez, Associate Professor, Mechanical and Aerospace Engineering,
University of California, San Diego
"Self-triggered computations for multi-agent systems"
Schiciano A

9:50-10:30 **KEYNOTE LECTURE**
Jie Gao, Associate Professor, Computer Science, Stony Brook University
"Geometric Greedy Routing In Wireless Sensor Networks"
Schiciano A

10:30-10:40 **COFFEE BREAK**
FCIEMAS Pre-function Lobby

10:40-12:00 pm **BRIEF TALKS**

Session A: **Information-Driven Environmental Sensing and Prediction:
Ecosystem and Eco-Hydrological Dynamic Modeling and Prediction
Schiciano A**

- 10:40-11:00 John Bang, Associate Professor, Environmental, Earth and Geospatial Sciences, North Carolina Central University
"Wireless Sensor Network for a Sustainable Ecosystem and Environmental Modeling"
- 11:00-11:20 Matthew Ross, IGERT WISeNet Trainee, Graduate Student, Biology, Duke University
"Spatiotemporal patterns of pollution in a river network"
- 11:20-11:40 Keith Rudd, IGERT WISeNet Trainee, Graduate Student, Mechanical Engineering and Materials Science, Duke University
"Optimal root densities in water limited ecosystems"
- 11:40-12:00 Xiaochi "Joe" Zhou, IGERT WISeNet Associate, Graduate Student, Civil and Environmental Engineering, Duke University
"Remote sensing estimation of water constituent concentrations in tidal systems: a case study"

Session B:

**Guidance and Control of Mobile Sensor Networks:
Intelligent Control and Coordination of Mobile Networks
Schiciano B**

- 10:40-11:00 Xinghai Hu, Graduate Student, Electrical & Computer Engineering, Carnegie Mellon University
"An Algorithm for Testing k-Coverage Condition in WSNs based on k-NPVD"
- 11:00-11:20 Caryl Erin Johnson, Chief Innovation Officer, Introspective Systems LLC
"Scalable Sustainable Communities: A Cloud Base Approach to Autonomic Sensor Integration and Control"

**Guidance and Control of Mobile Sensor Networks: Signal Processing
Schiciano B**

- 11:20-11:40 Nisar Ahmed, Postdoctoral Research Associate, Mechanical and Aerospace Engineering, Cornell University
"On Generalized Bayesian Data Fusion with Complex Models in Large Scale Networks"
- 11:40-12:00 Itay Cnaan-On, IGERT WISeNet Trainee, Graduate Student, Electrical and Computer Engineering, Duke University
"Energy-efficient Simultaneous Wireless Telemetry and Node Localization of Distributed Sensor Networks"

12:00-1:00 pm

LUNCH BREAK
FCIEMAS Atrium – Ground Level

1:00-3:00

BRIEF TALKS

Session A:

**Information-Driven Environmental Sensing and Prediction:
Ecosystem and Eco-Hydrological Dynamic Modeling and Prediction
Schiciano A**

- 1:00-1:20 Tiffany Wilson, IGERT WISeNet Trainee, Graduate Student, Civil and Environmental Engineering, Duke University
"Towards optimal placement and operation of soil moisture sensors based on land surface features and topography"
- 1:20-1:40 Adam Wolf, Postdoctoral Research Associate, Ecology and Evolutionary Biology; Lecturer, Civil and Environmental Engineering, Princeton University
"PULSE: The Princeton University Low-cost Sensor Effort"
- 1:40-2:00 Julio Herrera Estrada, Graduate Student, Civil and Environmental Engineering, Princeton University
"Network Design for the Deployment of Wireless, Low-Cost Sensors for Drought Monitoring"

**Information-Driven Environmental Sensing and Prediction:
Sensor Data Processing, Fusion, and Simulation
Schiciano A**

- 2:00-2:20 Tierney Foster-Wittig, IGERT WISeNet Trainee, Graduate Student, Civil and Environmental Engineering, Duke University
"Experiment on Geospatial Monitoring of Air Quality and Pollutants: Locating Leaky Natural Gas Wells"
- 2:20-2:40 Cassandra Carley, IGERT WISeNet Trainee, Graduate Student, Computer Science, Duke University
"Features for Human Hand Tracking"

Session B:

**Guidance and Control of Mobile Sensor Networks: Active Sensing
Schiciano B**

- 1:00-1:20 Ashleigh Swingler, IGERT WISeNet Trainee, Graduate Student, Mechanical Engineering and Materials Science, Duke University
"A Mixed Integer Programming Approach to Sensor Path Planning"
- 1:20-1:40 Charles Freundlich, Graduate Student, Mechanical Engineering, Stevens Institute of Technology
"A Hybrid Control Approach to the Next-Best-View Problem using Stereo Vision"

**Guidance and Control of Mobile Sensor Networks: Unmanned Vehicles
Schiciano B**

- 1:40-2:00 Lorenzo Marconi, Professor, Department of Electronics, Computer Science and Systems, University of Bologna, Italy
"Design and Experimental Validation of a Control Strategy for a Miniature Quadrotor Aerial Vehicle"

**Information-Driven Environmental Sensing and Prediction:
Sensor Management
Schiciano B**

2:00-2:40 James Shaeffer, Graduate Student, Electrical and Computer Engineering, Northern Arizona University
"A Middleware-Based Approach to the Design of Interconnected Sensor/Actuator Networks"

2:40-3:00 Karoline Johnson, Engineering Intern, Student Services Contractor to United States Environmental Protection Agency (US EPA), Office of Research and Development
"Applying sensor networks to evaluate air pollutant emissions from fugitive and area sources"

3:00-3:10 **COFFEE BREAK**
FCIEMAS Pre-function Lobby

3:10-4:30 **TUTORIAL SESSIONS**

Biologically-Inspired Intelligent Sensor Systems: Information Theory
Schiciano A

3:10-3:50 Daniel Gauthier, Robert C. Richardson Professor of Physics, Duke University
"Tutorial on Autonomous Time-Delay Boolean Networks"

**Information-Driven Environmental Sensing and Prediction:
Sensor Data Processing, Fusion, and Simulation**
Schiciano A

3:50-4:30 Wilkins Aquino, Associate Professor, Civil and Environmental Engineering, Duke University
"An Introduction to the Inverse Problems: Theory, Algorithms, and Applications"

4:30 **ADJOURN**