



4th Annual Meeting of the AFRL Mathematical Modeling and Optimization Institute

MEETING PROGRAM



University of Florida
Research & Engineering Education Facility (REEF)
Shalimar, FL
July 25–28, 2016

Meeting Information

Registration

Registration is free and all meeting attendees must register. **All presenters have been automatically registered.** Non-presenting attendees can register by emailing the organizers at mmo.meeting.2016@gmail.com with your name and affiliation or stopping by the registration desk on-site. Registration material can be picked up on Monday–Thursday 8:30am–4:15pm in the UF-REEF lobby.

Coffee Breaks

Coffee breaks will be held at 9:45–10:00am and 2:30–2:45pm on Monday–Thursday in the UF-REEF lobby.

Luncheon

Lunch will be provided to the registered meeting attendees from 11:30am–1:00pm on Monday–Thursday in the UF-REEF lobby.

Internet Access

Internet access is available free of charge.
Network SSID: ufvisitor

Meeting Rooms

Sessions A and B - Auditorium
Sessions C1 and D1 - Auditorium
Sessions C2 and D2 - Room 117

Monday, July 25th

9:00 Opening Remarks by Vladimir Boginski (Auditorium)

9:00-9:45 Plenary Session A (Auditorium)

A Simplified Approach to The Regularization of Control-Constrained Trajectory Optimization Problems

Michael J. Grant, Assistant Professor, Purdue University

9:45-10:00 Coffee Break

10:00-11:30 Session B (Auditorium)

Challenges in Modeling of Inelastic Deformation and Damage in Titanium: Multi-scale Modeling and Validation

Oana Cazacu, University of Florida

Role of Tension-Compression Asymmetry on Low Cycle Fatigue

Benoit Revil-Baudard, University of Florida

Implementation of Surface Roughness in a Pseudo-Spectral Solver for Direct Numerical Simulation of Bypass Transition

Shanti Bhushan, Mississippi State University

11:30-1:00 Luncheon

1:00-2:30 Session C1 (Auditorium)

Modeling the Deformation Response of Hexagonal Metals Under Strain Path Changes

Nitin Chandola, University of Florida

Effective Thermoelastic and Thermal Properties of Metal-Ceramic Composites with Spatially Tailored Microstructures

Phillip Deierling, University of Iowa

Simulation of Thermal Ablation in Laminated Composite Materials with Finite Element Analysis

Yeqing Wang, University of Iowa

A Summary of High-Fidelity Numerical Studies of Flow Acoustic Resonant Interactions in Transitional Airfoils

Lap Nguyen, Embry-Riddle Aeronautical University

1:00-2:30 Session C2 (Room 117)

Relative Edge Optimization for Multi-Agent MAV Mapping

David Wheeler, Brigham Young University

Guidance-Assisted Monocular SLAM Scale Estimation

Daniel Whitten, Texas A&M University

GPS-Denied Cooperative Navigation in Real-Time

Hunter Young, Oklahoma State University

Robust Multi-Sensor GPS-Denied Navigation

Daniel Koch, Brigham Young University

2:30-2:45 Coffee Break

2:45-4:15 Session D1 (Auditorium)

Singular Value Decomposition for Rapid Simulation of a Hypersonic Vehicle

Ryan Klock, University of Michigan

Fluid-Structure-Jet Interaction Modeling for Flexible High Speed Vehicles

Ryan Kitson, University of Michigan

Variable Fidelity Aerothermodynamic Modeling for Multi-Discipline Modeling of Hypersonic Vehicles

Emily Dreyer, Ohio State University

Multi-Fidelity Unsteady Aerodynamic Modeling of Agile and Flexible High-Speed Vehicles

Dianne Zettl, Ohio State University

2:45-4:15 Session D2 (Room 117)

Geometric Adjoining Methods in Indirect Trajectory Optimization

Michael Sparapany, Purdue University

Navigation Based Path Planning Using Optimal Control Theory

Sean Nolan, Purdue University

Adaptive Gimbal Control and Fixed-wing Target Tracking

Jae Lee, Brigham Young University

Tuesday, July 26th

9:00-9:45 Plenary Session A (Auditorium)

From GPS and Google Maps to Spatial Big Data

Shashi Shekhar, Distinguished Professor, University of Minnesota

9:45-10:00 Coffee Break

10:00-11:30 Session B (Auditorium)

Nonlinear Coupled Thermoelastic Beam Vibration Model and Thermoelastic Equations of Motion

Yuri Antipov, Louisiana State University

Modeling of Flapping Airfoils in Proximity to Walls for Lift and Thrust Generation

Alex Povitsky, University of Akron

On the Optimal Stackelberg-Nash Risk-Averse Control Problems

Getachew K. Befekadu, NRC and University of Florida

11:30-1:00 Luncheon

1:00-2:30 Session C1 (Auditorium)

Switched Control of Semi-Autonomous Vehicles

Michael McCourt, University of Florida

Leader-Follower Consensus with Unknown Control Direction

Chau Ton, NRC

Coverage Control Based Effective Jamming Strategy for Wireless Networks

Zhen Kan, University of Florida

Acceleration-free Nonlinear Guidance and Tracking Control of Hypersonic Missiles for Maximum Target Penetration

Siddhartha Mehta, University of Florida

1:00-2:30 Session C2 (Room 117)

Fast Computation of Large-scale Linear Dynamical Network Learning

Xianqi Li, University of Florida

Weighted Sampling For Stochastic Optimization

Chenxi Chen, University of Florida

Convolutional Sparse Coding on Image Representation and Classification

Zhijie Feng, University of Florida

2:30-2:45 Coffee Break

2:45-4:15 Session D1 (Auditorium)

Sequential Max-Min Bilevel Linear Programming with Incomplete Information and Learning

Juan S. Borrero, University of Pittsburgh

Critical Arcs Detection in Influence Networks

Colin Gillen, University of Pittsburgh

Assignment Problem for Drone Delivery Under Bounded Rationality

Guanxiang Yun, University of Central Florida

Measuring Network Robustness Using Information Theory

Arsenios Tsokas, University of Florida

2:45-4:15 Session D2 (Room 117)

Decentralized LQT in a Limited Information Environment

Clay Robertson, Auburn University

A Reduced Element Map Representation For Path Planning And Obstacle Avoidance

Jinyoung Park, Auburn University

3D Road Geometry Recovery and Ground Target Motion Prediction by UA Using a Single Camera

Yingmao Li, University of Texas at Dallas

Camera Pose Estimation Using Quaternions

Kaveh Fathian, University of Texas at Dallas

Wednesday, July 27th

9:00-9:45 Plenary Session A (Auditorium)

Finding Critical Links for Closeness Centrality

Oleg Prokopyev, Associate Professor, University of Pittsburgh

9:45-10:00 Coffee Break

10:00-11:30 Session B (Auditorium)

An Accelerated Extended Cutting Plane Approach with Piecewise Linear Approximations for Signomial Geometric Programming

Qipeng Phil Zheng, University of Central Florida

Assessing User Engagement Capacity as a Driver of Reach of Online Health Platforms

Alexander Nikolaev, University at Buffalo

Ranking Academic Advisors: Analyzing Scientific Advising Impact using MathGenealogy Social Network

Vladimir Boginski, University of Central Florida & University of Florida

11:30-1:00 Luncheon

1:00-2:30 Session C1 (Auditorium)

Path Planning for Optimal Cooperative Navigation

Adam J. Rutkowski, Air Force Research Laboratory

Validating a Model For Detecting Magnetic Field Intensity Using Dynamic Neural Fields

Brian K. Taylor, Air Force Research Laboratory

Network Delay Modeling For Assisted Global Navigation Satellite System (A-GNSS) And Magnetic Field-Based Navigation

Grant Huang, National Research Council

1:00-2:30 Session C2 (Room 117)

Modelling Social Influence

Abhinav Perla, University at Buffalo

Distributed Coalitional Learning

Rahul Gopalsamy, University at Buffalo

A Continuous-Time Actor-Oriented Model for Decentralized Communication Network Formation

Anastasia Nikolaeva, University at Buffalo

2:30-2:45 Coffee Break

2:45-4:15 Session D1 (Auditorium)

On Landscape Graphs of Large-Scale Search for Multi-Sensor Multiple Target Tracking

Alla Kammerdiner, New Mexico State University

Identifying Resilient Structures In Networks: A Two-Stage Stochastic Optimization Approach

Maciej Rysz, NRC & University of Florida

Risk Averse Weapon-Target Assignment Problems

Konstantin Pavlikov, University of Florida

Scalable Communication for Parallel Optimization

Oleg Shylo, University of Tennessee

2:45-4:15 Session D2 (Room 117)

Vision-Based Control with Unknown Time Varying State Delay and Known Time Varying Input Delay with NN based Delay Estimate

Indrasis Chakraborty, University of Florida

Utilizing Regional and Local State-Following Approximations for Online Approximate Optimal Regulation

Patryk Deptula, University of Florida

Autonomous Herding of Uncontrolled Fleeing Agents with Switching Between Multiple Targets

Ryan Licitra, University of Florida

Decentralized Motion Control to Achieve Robust Multi-Agent Networks

Zachary Hutcheson, University of Florida

Thursday, July 28th

9:00-9:45 Plenary Session A (Auditorium)

Assured Autonomy for Agents Operating in Contested Environments
Warren Dixon, Professor, University of Florida

9:45-10:00 Coffee Break

10:00-11:30 Session B (Auditorium)

Theoretical Advances and Practical Algorithms for Adaptive Autonomy in Contested Environments

Girish Chowdhary, University of Illinois at Urbana-Champaign

Cheap Approximate Localization Using FM Radio

Piyush Kumar, Florida State University

Comparison Between Stochastic and Simulation Based Optimization of Reactive Burn Models for Energetic Materials

Robert J. Dorgan, Air Force Research Laboratory

11:30-1:00 Luncheon

1:00-2:30 Session C1 (Auditorium)

High Communication Efficiency Subgraphs

Vladimir Stozhkov, University of Florida

A New Clique Relaxation Model with Small-World Properties

Jongeun Kim, University of Florida

Network Optimization on Materials Graph. Estimates For The Independent Union of Cliques Problem

Eugene Lykhovyd, Texas A&M University

TruthCore: Non-parametric Estimation of Truth From A Collection of Authoritative Sources

Tathagata Mukherjee, Florida State University

1:00-2:30 Session C2 (Room 117)

Monocular Camera Depth Filtering using Particle Filters

Zachary Bell, University of Florida

Imitating Fixed-wing Aircraft Flight Characteristics for use in Multirotor Surrogate

Christian Harris, University of Florida

Experimental Validation for Visual Servo Control of an Unmanned Ground Vehicle via a Moving Airborne Monocular Camera

Hsi-Yuan Chen, University of Florida

2:30 Concluding Remarks
