

Concurrent Workshops on Day 1, 3:30 - 5:00 PM, April 29

1-1: Aspiring Robotics Principal Investigators (Invitation Only, Blue Group)

Room Location: Key Ballroom 9

Organizers: Jordan Berg, NSF, Juan Wachs, NSF

3:30 – 3:35pm: Robotics PD Introduction (5 mins)

3:35 – 3:43pm: Overview of FRR Program (8 mins)

3:43 – 3:51pm: Overview of the Proposal Review and Funding Processes (8 mins)

3:51 – 4:16pm: Panel on Developing a Successful NSF Proposal (25 mins)

- Writing Great Proposals (5mins)
- Career Awardee (Kirstin H. Petersen, Cornell, 5mins)
- Frequent Mistakes in Proposals, Dos and Don'ts (5mins)
- Q&A to the Panel (10mins)

4:16 – 5:00pm: Huddles with PDs (44 mins)

1-2: Harnessing AI and Robotic Technologies for Smart and Precision Agriculture

Room Location: Key Ballroom 10

Organizers:

- Zhaojian Li, Michigan State University, lizhaoj1@egr.msu.edu
- Yunjun Xu, University of Central Florida, Yunjun.Xu@ucf.edu
- Ajay Sharda, Kansas State University, asharda@ksu.edu

3:30 – 3:35pm: Opening remarks (Zhaojian Li)

3:35 – 4:35pm: Invited talks (Speakers introduced by Yunjun Xu)

3:35 – 3:45pm: “Speeding-up Multi-armed Robotic Fruit Harvesting”, Stavros Vougioukas, UC Davis

3:45 – 3:55pm: “Configurable, Adaptive, and Scalable Swarm (CASS) for Smart and Collaborative Agriculture”, Kiju Lee, Texas A&M

3:55 – 4:05pm: “Application of Soft Robotics in Agriculture”, Robert Shepherd, Cornell Univ.

4:05 – 4:15pm: “Challenges and Research Opportunities in Developing Contact-Based Precision Robotic Pollinators”, Yu Gu, West Virginia University

4:15 – 4:25pm: “HAUCS: Robotic Systems for Scalable, Adaptable Maintenance of Pond Aquaculture Farms”, Bing Ouyang, Florida Atlantic University

4:25 – 4:35pm: “From Precision Weed Management to Spatial Mapping: A fleet of Autonomous Robots for Precision Agriculture”, Abhisesh Silwal, Carnegie Mellon University

4:35 – 5:00pm: Q&A and Panel Discussion (Moderated by Ajay Sharda)

1-3: Vision and Challenges for Medical Robotics: Surgical Robots

Room Location: Key Ballroom 11

Organizers:

- Axel Krieger, Johns Hopkins University, axel@jhu.edu
- Alan Kuntz, University of Utah, alan.kuntz@utah.edu

3:30 – 3:50pm: “The Future of Surgical Robotics: Vision, Challenges, and the Science to Meet Them”, Axel Krieger and Alan Kuntz

3:50 – 4:05pm: “Controlling Microrobot Swarms Using Rotating Magnetic Fields”, Jake Abbott, University of Utah

4:05 – 4:20pm: “Translating NSF Robotics Discoveries to the Real World”, Robert J. Webster III, Vanderbilt University

4:20 – 4:35pm: “Towards More Human-Aware Robotic Systems for Surgical Training and Intervention”, Ann Majewicz-Fey, University of Texas

4:35 – 5:00pm: Panel Discussion

1-4: Opportunities, Challenges and Tools for Space Robotics and Autonomy

Room Location: Key Ballroom 12

Organizers:

- Souma Chowdhury, University at Buffalo, soumacho@buffalo.edu
- Eleonora Botta, University at Buffalo, ebotta@buffalo.edu

3:30 – 3:40pm: Opening Remarks, Federico Rossi, NASA JPL (Zoom)

3:40 – 4:40pm: Round-table Discussions (3-4 working groups)

4:40- 5:00pm: Summary of Discussions from Each Group

1-5: Challenges and Opportunities for Dexterous Robotic Manipulation

Room Location: Key Ballroom 6

Organizers:

- Hongsheng He, University of Alabama, hongsheng.he@ua.edu
- Roger Quinn, Case Western Reserve University, roger.quinn@case.edu

3:30 – 3:45pm: "Soft Robotic Grasping", Roger Quinn, Case Western Reserve University

3:45 – 4:00pm: "Learning Robot Manipulation Skills with Physics-based Models in the Human-centered Environments", Ahmed. H. Qureshi, Purdue University

4:00 – 4:15pm: "Mixed-transducer micro-origami for small-scale manipulation", Kenn Oldham, University of Michigan

4:15 – 4:30pm: "Towards Using Grasping Compliance of Underactuated Hands in Model-mediated Telemanipulation", Long Wang, Stevens Institute of Technology

4:30 – 4:45pm: "Context-Aware Task-Oriented Grasping by a Dexterous Robotic Hand", Hongsheng He, University of Alabama

4:45 – 5:00pm: Q&A and Panel discussions

Concurrent Workshops on Day 2, 2:00 - 3:30 PM, April 30

2-1: Aspiring Robotics Principal Investigators (Invitation Only, RED Group)

Room Location: Key Ballroom 9

Organizers:

- Jordan Berg, NSF
- Juan Wachs, NSF

2:00 – 2:05pm: Robotics PD Introduction

2:05 – 2:13pm: Overview of FRR Program

2:13 – 2:21pm: Overview of the Proposal Review and Funding Processes

2:21 – 2:46pm: Panel on Developing a Successful NSF Proposal

- Writing Great Proposals (5mins)
- Career Awardee (Hongsheng He, University of Alabama, 5mins)
- Frequent Mistakes in Proposals, Dos and Don'ts (5mins)
- Q&A to the Panel (10mins)

2:46– 3:30pm: Huddles with PDs

2-2: Challenges and Opportunities for Aerial Robots Across Scales

Room Location: Key Ballroom 10

Organizers:

- Yufeng (Kevin) Chen, MIT, yufengc@mit.edu
- Brittany Duncan, University of Nebraska–Lincoln, bduncan@unl.edu

2:00 – 2:10pm: "MP2: One motor Micro Aerial Vehicle for Swarm Applications", Michael Rubenstein, Northwestern University

2:10 – 2:20pm: "Atmospheric Ion Thrusters for Micro Air Vehicles", Daniel Drew, Univ. Utah

2:20 – 2:30pm: "Insect-scale Aerial Robots Powered by Soft Artificial Muscles", Kevin Chen, MIT

2:30 – 2:40pm: "Dispersed Autonomy for Aerial Robots: Cloud Robotics in the Clouds", Eric Frew, University of Colorado, Boulder

2:40 – 2:50pm: "Air/Ground Coordination for Deployments over Large Spatial and Temporal Scales", Pratap Tokekar, University of Maryland.

2:50 – 3:00pm: "Improving Drones to Interact with Everyone", Brittany Duncan, University of Nebraska-Lincoln

3:00 – 3:30pm: Q&A and Panel discussions

2-3: Taking the Fantastic Voyage: Small-Scale Robots as a Biomedical Technology

Room Location: Key Ballroom 11

Organizers:

- Xiaolong Liu, Texas Tech University, Xiaolong.liu@ttu.edu
- Marc Miskin, University of Pennsylvania, mmiskin@seas.upenn.edu

2:00 – 2:20pm: "Taking the Fantastic Voyage: Small-Scale Robots as a Biomedical Technology", (Xiaolong Liu and Marc Miskin)

2:20 – 2:35pm: "The Incredible Shrinking Robot: Fact and Fiction in Microscale Implantables", Pamela Abshire, University of Maryland, College Park

2:35 – 2:50pm: "Nanoscale Bacteria-Enabled Autonomous Delivery Systems (NanoBEADS) for Cancer Therapy", Bahareh Behkam, Virginia Tech

2:50 – 3:10pm: "Combating Oral Biofilm Infections Using Microrobots", Hyun (Michel) Koo and Ed Steager, University of Pennsylvania

3:10 – 3:30pm: Q&A and Panel discussions

2-4: Addressing Safe Interaction Between Autonomous and Human-driven Vehicles

Room Location: Key Ballroom 12

Organizers:

- Andreas A. Malikopoulos, Cornell University, amaliko@cornell.edu

2:00 – 2:20pm: "Time-Optimal Trajectory Planning for Connected and Automated Vehicles in Mixed-Traffic Scenarios", Andreas A. Malikopoulos, Cornell University

2:20 – 2:40pm: "Improving Urban Traffic with Autonomous and Human-Driven Vehicle Integration", Murat Arcaç, UC Berkeley

2:40 – 3:00pm: "Reactive Control for Connected and Automated Vehicles in Mixed Environments", Logan Beaver, Old Dominion University

3:00 – 3:20pm: "Waves, Barriers, and the Safety of Mixed Traffic Systems", Hosam Fathy, University of Maryland

3:20 – 3:30pm: Panel Discussion

2-5: Safety of LfD Algorithms in the Wild

Room Location: Key Ballroom 6

Organizers:

- Momotaz Begum, University of New Hampshire, momotaz.begum@unh.edu

2:00 – 2:05pm: Opening remarks (Momotaz Begum)

2:05 – 2:25pm: "Learning Shared Safety Constraints from Multi-task Demonstrations", Sanjiban Chowdhury, Cornell University

2:25 – 2:45pm: "Beyond Imitation Learning: Robust Policies via Offline RL and Active Feedback", Sergey Levine, University of California, Berkeley (Zoom)

2:45 – 3:05pm: "Exploiting Safety Guidance for Enhancing Data Efficiency in Imitation Learning", Somil Bansal, University of Southern California

3:05 – 3:30pm: Q&A and Panel Discussion

Zoom link for virtual attendance:

<https://unh.zoom.us/j/96007521988?pwd=OTYzekp2MDlmV3lMYXp3TmFIZTJhUT09>