



CONFERENCE ROOM: 17 Hillhouse Avenue, Ground Floor (TEAL Classroom)

SCHEDULE OVERVIEW

8:30 — 9:00	Registration
9:00 — 9:10	Welcome and Introduction — Aaron Dollar, Rebecca Kramer-Bottiglio
9:15 — 10:15	Session 1: Design (4 talks)
10:15 — 10:45	Coffee Break
10:45 — 11:45	Session 2: Dynamics and Control (4 talks)
11:45 — 12:30	Keynote (Helen Huang, NCSU/UNC)
12:30 — 1:30	Lunch
1:30 — 2:30	Session 3: Planning and Perception (4 talks)
2:30 — 3:00	Poster lightning presentations
3:00 — 5:00	Poster Session
4:00 — 5:00	Social Hour with Poster Session and (optional) Lab Tours

TALK SCHEDULE

Session 1: Design

9:15 — 9:30	<i>Robotic Skins</i> Joran Booth, Dylan Shah, Jennifer Case, Edward White, Michelle Yuen, Olivier Cyr-Choiniere, and Rebecca Kramer-Bottiglio (Yale)
9:30 — 9:45	<i>What Makes a Hand? An Overview of our Recent Work on Tactile Sensors, Hand Design, Teleoperation, and Grasp Analysis</i> Maximilian Haas Heger, Cassie Meeker, Sangwoo Park, Pedro Piacenza and Matei Ciocarlie (Columbia)
9:45 — 10:00	<i>Tri-modal thin-film flexible electronic skin to augment robotic grasping</i> Caroline Yu, Ioannis Kyriassis (Columbia)

10:00 — 10:15 *Structure assembly with interlocking blocks*
Yinan Zhang and Devin Balkcom (Dartmouth)

Session 2: Dynamics and Control

10:45 — 11:00 *Robotic Manipulation of Space Objects*
David Carabis, Kimberly Oakes, John Wen (RPI)

11:00 — 11:15 *Dynamics of static finger contact*
Neelima Sharma and Madhusudhan Venkadesan (Yale)

11:15 — 11:30 *Testing Robot Teleoperation using a Virtual Reality Interface with ROS Reality*
Eric Rosen, David Whitney, Elizabeth Phillips, Daniel Ullman, Stefanie Tellex (Brown)

11:30 — 11:45 *Streamlining Manipulation with Underactuation*
Berk Calli, Andrew Morgan, Krishnan Srinivasan, Andrew Kimmel, Kaiyu Hang, Kostas Bekris, Aaron Dollar (Yale)

Keynote (Abstract and Bio Below)

11:45 — 12:30 *Towards Bionic Limbs: Volitional Control of Upper-limb Prostheses*
Helen Huang (NCSU/UNC)

Session 3: Planning and Perception

1:30 — 1:45 *Workspace-Aware Online Grasp Planning*
Iretiayo Akinola, Jacob Varley, Boyuan Chen, and Peter K. Allen (Columbia)

1:45 — 2:00 *Perception and Planning for Warehouse Manipulation Tasks*
Kostas Bekris (Rutgers)

2:00 — 2:15 *Shape-based Object Classification and Recognition through Continuum Manipulation*
Huitan Mao, Jing Xiao, Mabel M. Zhang, Kostas Daniilidis, Junius Santoso, Cagdas Onal (UNCC, Penn, and WPI)

2:15 — 2:30 *Deictic abstraction for robotic manipulation*
Colin Kohler, Marcus Gualtieri, Robert Platt (Northeastern)
Towards Bionic Limbs: Volitional Control of Prosthesis

Keynote: *Towards Bionic Limbs: Volitional Control of Upper-limb Prostheses*
Helen Huang (NCSU/UNC)

Abstract: Limb amputation is a devastating injury that leads to permanent physical disabilities, ongoing healthcare costs, and dramatically reduced quality of life. Advanced robotic prostheses, such as dexterous prosthetic hands, have become commercially available. However, the function of these robotic devices is still limited due to lack of neural control.

In this talk, I will present my research in developing EMG-based neural-machine interface for robotic upper-limb prostheses in order to enable amputees to use their prosthetic limbs intuitively and efficiently. I will also discuss the needed future studies and technologies to elicit embodiment and full motor function restoration of individuals with arm amputations.

Speaker Biography: Dr. He (Helen) Huang is a Professor in the Joint Department of Biomedical Engineering at North Carolina State University (NCSU) and the University of North Carolina at Chapel Hill (UNC), and Director of the Closed-Loop Engineering for Advanced Rehabilitation (CLEAR) core. Dr. Huang's research interest lies in neural-machine interfaces for artificial limbs and exoskeletons, wearer-robot interaction, adaptive and optimal control of wearable robots, and human movement control. She was a recipient of the Delsys Prize for Innovation in Electromyography, the Mary E. Switzer Fellowship with the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR), and a NSF CAREER Award; she was named NC State faculty scholar in 2015. She is a senior member of IEEE and a member of the Society for Neuroscience and Biomedical Engineering Society.

POSTERS (as of June 13)

1. Design and Optimization of a Stewart-Gough Platform-Inspired Dexterous Robotic Hand
Connor M. McCann and Aaron M. Dollar
2. On the Similarities and Differences among Popular Contact Models in Robot Simulation
Peter Horak and Jeff Trinkle
3. Robotic Welding Seam Inspection
Jinda Cui, John Wen, Jeff Trinkle, Stacy Patterson
4. Intuitive Hand Teleoperation by Novice Operators Using a Continuous Teleoperation Subspace
Cassie Meeker, Thomas Rasmussen and Matei Ciocarlie
5. Passive Static Equilibrium with Frictional Contacts and Application to Grasp Stability Analysis
Maximilian Haas-Heger, Christos Papadimitriou, Mihalis Yannakakis, Garud Iyengar and Matei Ciocarlie
6. Tactile Sensing with Overlapping Signals
Pedro Piacenza, Emily Hannigan, Sydney Sherman, Clayton Baumgart, Keith Behrman, Ioannis Kyminis and Matei Ciocarlie
7. Development of a Tendon Driven Hand Orthosis for Functional Grasp Assistance after Stroke
Sangwoo Park, Cassie Meeker, Lynne Weber, Lauri Bishop, Joel Stein and Matei Ciocarlie
8. Autonomous Trash Picking Robot
Brayan S. Zapata-Impata, Vikrant Shah, Robert Platt, Hanumant Singh

9. LLDM: Locally linear distance maps for motion planning problems
Galen Brown, Lisa Oh, Janvi Kalra, Madeleine Genereux, Eitan Vilker, Devin Balkcom
10. Compliant Electric Actuators Through Handed Shearing Auxetics
Lillian Chin, Jeffery Lipton, Robert MacCurdy, John Romanishin, Chetan Sharma, and Daniela Rus
11. Analyzing Exfordance Use by Unilateral Upper-Limb Amputees
Jillian Cochran, Adam Spiers, Aaron Dollar
12. Development of the Yale MyoAdapt Hand
Michael Leddy and Aaron Dollar
13. Contact-implicit trajectory optimization for pushing manipulation
Aykut Onol, Philip Long, & Taskin Padi
14. Data Driven Detection of Manipulation States
Andrew Morgan, Berk Calli, Aaron Dollar
15. All-Soft Material System for Strong Soft Actuators
R. Adam Bilodeau, Aslan Miriyev, Hod Lipson, Rebecca Kramer-Bottiglio
16. Transparent Role Assignment and Task Allocation in Human Robot Collaboration
Alessandro Roncone, Olivier Mangin, Brian Scasselati
17. People conform to groups of robots
Nicole Salomons, Sarah Sebo, Brian Scasselati
18. Situated Human-Robot Collaboration: Predicting Intent from Grounded Natural Language
Jake Brawer, Olivier Mangin, Alessandro Roncone, Sarah Widder, Brian Scasselati
19. Agency in Animal-Robot Interaction: Do dogs (*Canis familiaris*) Understand Pointing Behaviour in Humanoid? (ON GOING)
Meiying Qin, Abigail Waugh, Michael Bogese, Brian Scasselati, Laurie Santos
20. GelSlim: A High-Resolution, Compact, Robust, and Calibrated Tactile-sensing Finger
Elliott Donlon, Siyuan Dong, Melody Liu, Jianhua Li, Edward Adelson and Alberto Rodriguez
21. A Clustering Approach to Categorizing 7 Degree-of-Freedom Human Arm Motions
Yuri Gloumakov, Adam Spiers, Aaron Dollar
22. Augmented Mobility Aids for Assistive Manipulation
Andreas Ten Pas, Marcus Gualtieri, Robert Platt, Abraham Shultz, James Kuczynski, Holly Yanco
23. Toward Closed-Loop Control of Soft Pneumatic Grippers during Pack-and-Deploy Operations
Michelle C. Yuen, Trevor R. Lear, Henry Tonoyan, Maria Telleria, Rebecca Kramer-Bottiglio
24. Fingertip Surface Optimization for Robust Grasping on Contact Primitives
Haoran Song, Michael Wang, Kaiyu Hang
25. Kinematic Design and Initial Prototype of a 3DOF Wrist

Neil Bajaj and Aaron Dollar

26. Investigating Human-Robot Handover Release Behaviors
Zhao Han, Holly Yanco

27. Human Dexterous Within-Hand Object Manipulation Strategies
Jimin Hong and Aaron M. Dollar

28. Robotic Manipulation of Space Objects
David Carabis, Kimberly Oakes, John Wen