

Monday June 3, 2024

Workshops for 2024 ISMR

8:00am - 8:30am

Registration

Morning Session: 8:30am - 12:00pm

Title: Training the Future Medical Robotacist

Location: Marcus 1116

Title: Machine Learning with the da Vinci Research Kit

Location: Marcus 1117

Title: The Third Holistic Forum of Medical Robotic Junior Professors:
From Rehabilitation to Surgical Robots

Location: Marcus 1118

10:00am - 10:30am

Break and Refreshments

12:00pm - 1:00pm

Lunch

Afternoon Session: 1:30pm - 5:00pm

Title: Leveraging Slicer ROS2 for Simulation of Image-Guided Assisted Interventions in Gazebo (Ignition)

Location: Marcus 1117

Title: The Third Holistic Forum of Medical Robotic Junior Professors:
From Rehabilitation to Surgical Robots

Location: Marcus 1118

3:00pm - 3:30pm

Break and Refreshments

5:30pm - 7:30pm

2024 ISMR Reception

7:30pm - 10:00pm

2024 ISMR Dinner (By Invitation only)

**Tuesday
June 4, 2024**

Location: Marcus Nanotechnology Building,
Georgia Institute of Technology

8:00am - 8:30am

Registration

Welcome and Opening Remarks

8:30am - 8:45am

Jaydev P. Desai

Georgia Institute of Technology, USA

Oral Presentations - Session 1

8:45am - 10:15am

- Shrand, Jason; d'Almeida, Jesse; Wilke, Ethan; Reed, Amy; Kavoussi, Nicholas; Herrell, Duke; Ertop, Tayfun Efe; Webster III, Robert James. *Enhancing Accuracy in Transendoscopic Concentric Tube Robots for Monocular Endoscope Guidance*
- Sharma, Susheela; Go, Sarah; Bonyun, Jeff; Amadio, Jordan P.; Khadem, Mohsen; Alambeigi, Farshid. *Towards an Autonomous Minimally Invasive Spinal Fixation Surgery Using a Concentric Tube Steerable Drilling Robot*
- Regazzo, Giovanni Battista; Davoodi, Ayoob; Cai, Yuyu; Li, Ruixuan; Carrillo, Fabio; Laux, Christoph; Frnstahl, Philipp; Vander Poorten, Emmanuel B. *An Approach for Collaborative Robot-Assisted Endoscopic Lumbar Discectomy*
- Hao, Ran; Itsarachaiyot, Yuttana; Cavusoglu, M. Cenk. *Bayesian Optimization Based Preprocedural Planning for Robotic Left Atrial Appendage Occlusion*
- Rezayof, Omid; Sharma, Susheela; Kamaraj, Meenakshi; John, Johnson V.; Alambeigi, Farshid. *On the Potentials of Utilizing a Handheld Bioprinter for Treatment of Volumetric Muscle Loss Injuries*
- Smith, Mariana E.; May, Adam; Schwehr, Trevor; Erin, Onder; Tragesser, Cody; Scheese, Daniel; Mair, Lamar O.; Diaz-Mercado, Yancy; Hackam, David; Krieger, Axel. *MagnetoStalsis: Generating Peristalsis in an Artificial Bowel for Treatment of Short Bowel Syndrome (JMRR Paper)*

Rapid Fire Poster Session

10:15am - 10:35am

- Edmondson, David; Schulze, Kyle D.; Rose, Chad G.. *A Passive Anthropomorphic Instrumented Joint Model for DIP and PIP Finger Joints*
- Poole, Davis W.; Garza, Kimberly B.; Rose, Chad G.. *Design of a Robot to Test Human Capacity to Differentiate Stiffness Types in the Fingers*
- Hailey, Rhet O.; Johnston, Ann Ryan; Rose, Chad G.. *Robotic Upper Extremity Task Space Perturbation: Movement Analysis*
- Johnson, Cole; Maldonado-Conteras, Jairo; Young, Aaron. *Stability & Plasticity Control in Continual Learning Robotic Systems: A Study in Transfemoral Prosthetic Control*
- Johnston, Ann Ryan; Hailey, Rhet; Mishra, Kislaya; Allen, Brendon C.; Rose, Chad G.. *Real time fatigue estimation for FES controllers via mechanomyography*

- Kim, Minhyo; Song, Seung Ho; Park, Jun Seok; Jin, Sangrok. *Simulation of optimal location search to improve usability of surgical assist robots holding endoscope*
- Chen, C.; Prakash, R.; Codd, P. J.. *Precision in Practice: Enhancing Robotic Laser Surgery with Specialized Segmentation and Planning Web Application*
- Baskaran, Avinash; Neely, Patrick; Rose, Chad G.. *Hybrid Estimation of Human-Robot Dynamics via an Anthropomorphic Testbed*
- Han, John J.; Acar, Ayberk; Henry, Callahan; Wu, Jie Ying. *Depth Anything in Medical Images: A Comparative Study*

10:35am - 10:55am

Break and Refreshments

Oral Presentations - Session 2

10:55am - 12:10pm

- Al Harthy, Shamsa; Sadati, S.M.Hadi; Wu, Zicong; Seneci, Carlo Alberto; Bergeles, Christos. *Variable Stiffness Soft Eversion Growing Robot via Temperature Control of Low-Melting Point Alloy Pressurised Medium*
- Wang, Yifan; Qiu, Zheng; Tokuda, Junichi; Ehud, Schmidt; Kolandaivelu, Aravindan; Chen, Yue. *MR-Conditional Robotic Actuation of Concentric Tendon-Driven Cardiac Catheters*
- Hari, Kush; Kim, Hansoul; Panitch, William; Srinivas, Kishore; Schorp, Vincent; Dharmarajan, Karthik; Ganti, Shreya; Sadjadpour, Tara; Goldberg, Ken. *STITCH: Augmented Dexterity for Suture Throws Including Thread Coordination and Handoffs*
- Dang, Khoa; Qiu, Stephen; Hatch, Carter; Connor, Peter; Qin, Tony; Alterovitz, Ron; Webster III, Robert James; Rucker, Caleb. *Design of Transmission Tubes for Surgical Concentric Push-Pull Robots*
- Karimi, Zohre; Ho, Shing-Hei; Thach, Bao; Kuntz, Alan; Brown, Daniel. *Reward Learning from Suboptimal Demonstrations with Applications in Surgical Electrocautery*

12:10pm - 1:10pm

Lunch

Keynote

1:10pm - 2:10pm

Mark Trumbore

U.S. Food & Drug Administration

Oral Presentations - Session 3

2:10pm - 3:25pm

- Alam, Umme Kawsar; Haghshenas-Jaryani, Mahdi. *Model-Based Control for a Coupled Soft Robotic Exo-Digit and Anthropomorphic Finger with Multi-Contact Point Physical Interaction*

- Esfandiari, Mojtaba; Zhou, Yanlin; Dehghani, Shervin; Hadi, Muhammad; Munawar, Adnan; Phalen, Henry; Usevitch, David; Gehlbach, Peter; Iordachita, Ioan Iulian. *A Data-Driven Model with Hysteresis Compensation for I2RIS Robot*
- Miao, Albert; Lin, Shan; Lu, Jingpei; Richter, Florian; Ostrander, Benjamin; Funk, Emily; Orosco, Ryan; Yip, Michael C.. *HemoSet: The First Blood Segmentation Dataset for Automation of Hemostasis Management*
- Yamamoto, Kent; Zachem, Tanner; Moradkhani, Behnam; Chitalia, Yash; Codd, Patrick. *Towards the Development of a Tendon-Actuated Galvanometer for Endoscopic Surgical Laser Scanning*
- Moradkhani, Behnam; Kheradmand, Pejman; Jella, Harshith; Yamamoto, Kent; Tofangchi, Alireza; Codd, Patrick; Chitalia, Yash. *An FBG-Based Stiffness Estimation Sensor for In-Vivo Diagnostics*

3:25pm - 3:45pm

Break and Refreshments

Oral Presentations - Session 4

3:45pm - 5:15pm

- Ceja, Julio; Rezaeian, Saeed; Velez Cordero, Rodrigo; Hernandez-Cordero, Juan; Badie, Behnam; Sheng, Jun. *Towards a Robotically Steerable Laser Ablation Probe*
- Hassun, Andres; Kho, Kimberly; Williams-Brown, M. Yvette; Fey, Ann Majewicz. *Training with a Visual-Haptic Simulator for Trocar Insertion (JMRR Paper)*
- Ou, Yafei; Tavakoli, Mahdi. *Autonomous Soft-Tissue Needle Steering Using Reinforcement Learning Guided by Human Input (JMRR Paper)*
- Ravigopal, Sharan; Malhotra, Nidhi; Brumfiel, Timothy A.; Chern, Benjamin; Liu, Yuanning; Desai, Jaydev P.. *Middle Tube Rotation of the COAST Guidewire Robot: Design and Modeling*
- Sommer, Joseph; Gunderman, Anthony; Sengupta, Saikat; Huang, Zhefeng; Sigounas, Dimitri; Cleary, Kevin; Chen, Yue. *Concentric Tube Robot-Based Intracerebral Hemorrhage Evacuation in Ex Vivo Sheep Head: A Comparative Study*
- O'Connor, Grace; Lewis, Andrew; Gong, Alex; Burke, Daniel M.; Hannaford, Blake. *Manufacturing and Design Improvements of an Everting Airway Device Prototype*

5:15pm - 7:30pm

2024 ISMR Banquet

Wednesday
June 5, 2024

Location: Marcus Nanotechnology Building,
Georgia Institute of Technology

8:00am - 8:45am

Registration

Oral Presentations - Session 5

8:45am - 10:30am

- Hanley, David; Dhaliwal, Kev; Khadem, Mohsen. *Towards Unified Shape and Biosensing: Multiplexing Tilted and Standard Fiber Bragg Gratings*
- Chen, Xinhao; Bhattacharjee, Anuruddha; Mair, Lamar O.; Raval, Suraj; Addepalli, Pranav; Erin, Onder; Bell, Adrian; Diaz-Mercado, Yancy; Krieger, Axel. *Mitigating Singularities in Control of Magnetic Capsule Endoscopes Using a Novel Nested Electromagnetic Coil System (JMRR Paper)*
- Wang, Yuan; McCandless, Max; Donder, Abdulhamit; Pittiglio, Giovanni; Moradkhani, Behnam; Chitalia, Yash; Dupont, Pierre. *Using Neural Networks to Model Hysteretic Kinematics in Tendon-Actuated Continuum Robots*
- Shah, Om; Su, Yun-Hsuan (Melody). *3D Occupancy Reconstruction in Dynamic and Deforming Surgical Environments*
- Bui, Mai; Chalfant, Natalie; Sun, Cuiling; Fabrega, Sean; Peng, Haonan; Huang, Kevin; Su, Yun-Hsuan (Melody). *Expanding the Surgical Robotics Community: An Intuitive Sim-To-Real Control Framework for Raven-II with a Budget-Friendly Gamepad Controller*
- Fakhry, Ali; Le, Thaison; Zhang, Junzhe; Li, Rui. *TAJ: A Platform for Integrating Tumor Detection and Depth Perception for Endoscopic Surgery*
- Zhou, Haoying; Jiang, Yiwei; Gao, Shang; Wang, Shiyue; Kazanzides, Peter; Fischer, Gregory Scott. *Suturing Tasks Automation Based on Skills Learned from Demonstrations: A Simulation Study*

10:30am - 10:50am

Break and Refreshments

Oral Presentations - Session 6

10:50am - 12:05pm

- Barragan, Juan Antonio; Ishida, Hisashi; Munawar, Adnan; Kazanzides, Peter. *Improving the Realism of Robotic Surgery Simulation through Injection of Learning-Based Estimated Errors*
- Kibria, Zunaed; Bae, Sungjin; Chandra, Sourav; Chardon, Matthieu; Rymer, William Zev; Suresh, Nina. *Characterizing 3D Force Vectors to Improve the Assessment of Spasticity*
- Beckers, Wim-Alexander Beckers; Borghesana, Gianni; Poorten, Emmanuel Vander. *A Quasi-Static Model Accounting for Friction-Induced Hysteresis in Tendon-Actuated Superelastic Notched Tube Instruments (JMRR Paper)*
- Schaeffer, Leon; Herrmann, David; Boehm, Valter. *Theoretical investigations on a dynamic hand orthosis based on a prestressed compliant structure with respect to stiffness and wrist-forces*
- Heemeyer, Florian; Boehler, Quentin; Leuenberger, Fabio; Nelson, Bradley J.. *ROSurgical: An Open-Source Framework for Telesurgery*
- Lim, Yu Xian; Sharifi, Mojtaba. *A Chain-Based Cable-Driven Upper-Limb Exoskeleton: Design, Mechanical Analysis and Development*

- Kibria, Zunaed; Commuri, Sesh. *Intelligent Control of Prosthetic Leg for Gait Symmetry*

12:05pm - 1:05pm

Lunch

Oral Presentations - Session 7

1:00pm - 2:45pm

- Johnson, Cole; Maldonado-Contreras, Jairo; Young, Aaron. *Accelerating Constrained Continual Learning with Dynamic Active Learning: A Study in Adaptive Speed Estimation for Lower-Limb Prostheses*
- Baskaran, Avinash; Basyal, Sujata; Allen, Brendon; Rose, Chad. *NeuroGAIN: Deep Generative Neuromuscular Demand Forecasting for On-Line Optimization in Soft Hand Exoskeleton Control*
- Fredin, Erik; Pol, Nirmal; Zaliznyi, Anton; Diller, Eric D.; Kahrs, Lueder Alexander. *Estimating the Joint Angles of an Articulated Microrobotic Instrument Using Optical Coherence Tomography*
- Ma, Xihan; Zhang, Xiao; Wang, Yang; Nycz, Christopher J; Sungarian, Arno; Ji, Songbai; Zhang, Haichong. *Feasibility of Pointcloud-Based Ultrasound-CT Registration towards Automated, Robot Assisted Image-Guidance in Spine Surgery*
- Oh, Ki-Hwan; Borgioli, Leonardo; Mangano, Alberto; Valle, Valentina; Di Pangrazio, Marco; Toti, Francesco; Pozza, Gioia; Ambrosini, Luciano; Ducas, Alvaro; Zefran, Milos; Chen, Liaohai; Giulianotti, Pier Cristoforo. *Comprehensive Robotic Cholecystectomy Dataset (CRCD): Integrating Kinematics, Pedal Signals, and Endoscopic Videos*
- Pan, Haochi; Lim, Chae Woo; King, Katelyn; Guan, Renxiang; Draelos, Mark. *Active Motion Cancellation for Robotic Optical Coherence Tomography of Moving Eyes: A Nystagmus Phantom Study*
- Yang, Shuyuan; Lea, My H.; Golobish, Kyle R.; Beaver, Juan C.; Chua, Zonghe. *Vision-Based Force Estimation for Minimally Invasive Telesurgery Through Contact Detection and Local Stiffness Models (JMRR Paper)*

2:45pm - 3:05pm

Break and Refreshments

Oral Presentations - Session 8

3:05pm - 4:35pm

- Kulkarni, Yash; Sharma, Susheela; Amadio, Jordan P.; Alambeigi, Farshid. *Towards Biomechanical Evaluation of a Transformative Additively Manufactured Flexible Pedicle Screw for Robotic Spinal Fixation*
- Mackute, Emile; Abdalla, Ahad; Dickson, Stuart; Dhaliwal, Kevin; Khadem, Mohsen. *On Challenges of Monocular Pose Estimation for Endoluminal Navigation (JMRR Paper)*
- Zheng, Yi; Majewicz Fey, Ann. *Transformer-Based Automated Skill Assessment and Interpretation in Robot-Assisted Surgery*
- Bales, Ian; Reinsch, Adam; Sherrod, Brandon; Mazur, Marcus; Zhang, Haohan. *Design and Bench Demonstration of a Robotic System for Cervical Spine Deformity Surgery*

- Thompson, Jordan; Cho, Brian Y; Brown, Daniel; Kuntz, Alan. *Modeling Kinematic Uncertainty of Tendon-Driven Continuum Robots Via Mixture Density Networks*
- Mykhailyshyn, Roman; Majewicz Fey, Ann. *Low-Contact Grasping of Soft Tissue Using a Novel Vortex Gripper*

Closing Remarks

4:35pm - 4:45pm

Jaydev P. Desai

Georgia Institute of Technology, USA