

2022 International Symposium on Medical Robotics

April 13 - 15, 2022

Georgia Institute of Technology, Atlanta, GA, USA

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Speakers

2022 International Symposium on Medical Robotics

Audrey Marshall



Title: *Baby steps: The promise of robotics in pediatric interventional cardiac catheterization*

Bio: Dr. Marshall is a pediatric interventional cardiologist, currently serving as Section Head for Interventional Cardiology at the Hospital for Sick Children in Toronto. Her daily practice revolves around the performance of minimally-invasive, image-guided procedures on babies and young children born with congenital heart defects. She has over 20 years' of clinical experience in this field. She is also a pioneer in the field of fetal heart therapy, having developed instruments and techniques to perform catheterization procedures on human fetuses at mid-gestation. Her work has resulted in the publication of over 100 peer-reviewed articles and in addition to lecturing, she takes an active role in the education of trainees in her field.

Michael Goldfarb



Title: *Perspectives and lessons learned on the use and value of power in lower limb prostheses*

Bio: Dr. Goldfarb's research interests are primarily focused on the development of robotic limbs for upper and lower extremity amputees, and the development of exoskeletons for individuals with spinal cord injury and stroke. He has published over 250 papers and has been awarded over 40 US patents on related topics. He was recognized as among the Top 2% of Most Cited Scientists by Stanford University's list of top scientists, both in 2021 and in the career-long categories. Among his papers are ones awarded best-paper awards in 1997, 1998, 2003, 2007, 2009, 2013, and 2020, and papers that were finalists for best paper awards in 2015 and 2017. A portion of his research on the design and control of lower limb exoskeletons has also been translated to the commercial market, now sold as various versions of the Indego exoskeleton. Dr. Goldfarb was inducted into the US National Academy of Inventors in 2020.

ISMR Workshops: April 13 At-A-Glance

Wednesday, April 13, 2022			
Time	Workshops for 2022 ISMR		
8:00am - 8:30am	Registration		
8:30am - 12:00pm	The Holistic Forum of Medical Robotic Junior Professors: From Rehabilitation to Surgical Robots	ISMR Workshop on Diversity in Surgical Robotics Training	Surgical Robots: The Next Generation
	Location: Marcus 1116	Location: Marcus 1117	Location: Marcus 1118
10:00am - 10:30am	Break and Refreshments		
12:00pm - 1:00pm	Lunch		
1:30pm - 5:00pm	The Holistic Forum of Medical Robotic Junior Professors: From Rehabilitation to Surgical Robots	ISMR Workshop on Diversity in Surgical Robotics Training	Surgical Robots: The Next Generation
	Location: Marcus 1116	Location: Marcus 1117	Location: Marcus 1118
3:00pm - 3:30pm	Break and Refreshments		
5:30pm - 7:00pm	2022 ISMR Reception		
7:30pm - 10:00pm	2022 ISMR Dinner (By Invitation Only)		

ISMR: April 14-15

At-A-Glance

Thursday, April 14, 2022		Friday, April 15, 2022	
8:00am - 8:30am	Registration	8:00am - 8:30am	Registration
8:30am - 9:00am	Welcome and Opening Remarks	8:30am - 9:45am	Oral Presentations - Session 5
9:00am - 10:00am	Oral Presentations - Session 1		Journal 4
	Paper 7		Journal 2
	Paper 34		Journal 7
	Paper 17		Journal 5
	Paper 5		Journal 8
10:15am - 10:30am	Rapid Fire Poster Presentations	9:45am - 10:45am	Keynote
10:30am - 11:00am	Break and Refreshments	10:45am - 11:15am	Break and Refreshments
11:00am - 12:15pm	Oral Presentations - Session 2	11:15am - 12:30pm	Oral Presentations - Session 6
	Paper 29		Journal 1
	Paper 32		Journal 6
	Paper 27		Journal 3
	Paper 30		Paper 13
	Paper 21		Paper 18
12:15pm - 1:15pm	Lunch	12:30pm - 1:30pm	Lunch
1:15pm - 2:45pm	Oral Presentations - Session 3	1:30pm - 2:45pm	Oral Presentations - Session 7
	Paper 12		Paper 4
	Paper 24		Paper 10
	Paper 31		Paper 19
	Paper 28		Paper 15
	Paper 25		Paper 6
2:45pm - 3:45pm	Keynote	2:45pm - 3:15pm	Break and Refreshments
3:45pm - 4:15pm	Break and Refreshments	3:15pm - 4:00pm	Oral Presentations - Session 8
4:15pm - 5:15pm	Oral Presentations - Session 4		Paper 16
	Paper 1		Paper 14
	Paper 2		Paper 11
	Paper 3	4:00pm - 4:15pm	Closing Remarks
	Paper 26		
5:30pm - 7:30pm	2022 ISMR Banquet		

Wednesday April 13, 2022

Workshops for 2022 ISMR

8:00am - 8:30am

Registration

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

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

Location: Marcus 1116

Title: ISMR Workshop on Diversity in Surgical Robotics Training

Location: Marcus 1117

Title: Surgical Robots: The Next Generation

Location: Marcus 1118

10:00am - 10:30am

Break and Refreshments

12:00pm - 1:00pm

Lunch

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

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

Location: Marcus 1116

Title: ISMR Workshop on Diversity in Surgical Robotics Training

Location: Marcus 1117

Title: Surgical Robots: The Next Generation

Location: Marcus 1118

3:00pm - 3:30pm

Break and Refreshments

5:30pm - 7:00pm

2022 ISMR Reception

7:30pm - 10:00pm

2022 ISMR Dinner (By Invitation Only)

Thursday
April 14, 2022

Location: Marcus Nanotechnology Building

8:00am - 8:30am

Registration

Welcome and Opening Remarks

8:30am - 9:00am

Machelle Pardue,
Interim Wallace H. Coulter Chair and
Professor

Oral Presentations - Session 1

9:00am - 10:00am

- Wang, Zhen; Dong, Yong; FANG, YONG; Murong, Li; Xu, Tian; LEI, YONG. *A Light-Weight High-Accuracy 4-DOF Robot for CT-Image Guided Percutaneous Interventions*
- Retana, Manuel; Conyers, Drew; Atashzar, S. Farokh; Alambeigi, Farshid. *Autonomous Data-Driven Manipulation of an Unknown Deformable Tissue Within Constrained Environments: A Pilot Study*
- Long, Yonghao; CAO, Jianfeng; Deguet, Anton; Taylor, Russell H.; Dou, Qi. *Integrating Artificial Intelligence and Augmented Reality in Robotic Surgery: An Initial dVRK Study Using a Surgical Education Scenario*
- Alruwaili, Fayeze; Saeedi-Hosseiny, Marzieh S.; Guzman, Lance; mcmillan, sean; lordachita, Ioan Iulian; Abedin-Nasab, Mohammad. *A 3-Armed 6-DOF Parallel Robot for Femur Fracture Reduction: Trajectory and Force Testing*

Rapid Fire Poster Session

10:00am - 10:30am

- James J. Zhou, Amaar Quadri, Alykhan Sewani, Yara Alawneh, Rene Gilliland-Rocque, Christopher Magnin, Andrew Dueck, Graham A. Wright, M. Ali Tavallaei. *The Design and Performance Characterization of a Cable-Driven Parallel Manipulator Catheter*
- Ashutosh Raman, Tanner J. Zachem, Ravi Prakash, Guangshen Ma, Suraj Dhulipalla, Christine Park, Weston A. Ross, Sarah Plumlee, William Eward, Patrick Codd. *Automated Detection of Sarcoma Tissue in a Murine Model Using a Portable Endogenous Fluorescence Spectroscopy Device*
- Guangshen Ma, Ravi Prakash, Weston Ross, Patrick Codd. *A Data-driven Method for Robotic Laser Orientation Planning*
- Ji Woong (Brian) Kim, Peiyao Zhang, Peter Gehlbach, Iulian lordachita, Marin Kobilarov. *Autonomous Needle Insertion in Microsurgery Using a Surgical Robot and a Monocular Camera*
- Doris Xu, Barclay J. Umetsu, Zane A. Zook, Nathaniel Fino, Anoop Rajappan, Mark W. Schara, Jeffrey Berning, Nicolas Escobar, Daniel J. Preston, Marcia K. O'Malley. *A Textile-Based Approach to Wearable Haptic Devices*
- Yingdan Wu, Xiaoguang Dong, Jae-kang Kim, Chunxiang Wang, Metin Sitti. *Wireless Soft Millirobots for Climbing Three-dimensional Gastrointestinal Tissue Surfaces and Local Drug Delivery*

10:00am - 11:00am

Break and Refreshments

Oral Presentations - Session 2

11:00am - 12:15pm

- Brumfiel, Timothy; Sarma, Achraj; Desai, Jaydev P.. *Towards End-Effector Force Estimation for Steerable Micro-Scale and Meso-Scale Interventions Using FBG-based Force Sensing*
- Torkaman, Tannaz; Roshanfar, Majid; Dargahi, Javad; Hooshir, Amir. *Analytical Modeling and Experimental Validation of a Gelatin-based Shape Sensor for Soft Robots*
- Schoovaerts, Maarten; Li, Ruixuan; Niu, Kenan; Vander Poorten, Emmanuel B. *Quantitative Assessment of Calibration Motion Profiles in Robotic-assisted Ultrasound System*
- Varier, Vignesh Manoj; Kool Rajamani, Dhruv; Tavakkolmoghaddam, Farid; Munawar, Adnan; Fischer, Gregory Scott. *AMBF-RL: A real-time simulation based Reinforcement Learning toolkit for Medical Robotics*
- Jamil, Md. Faiyaz; Pokharel, Mishal; Park, Kihan. *Optical Manipulation of Microparticles in Fluids Using Modular Optical Tweezers*

12:15pm - 1:15pm

Lunch

Oral Presentations - Session 3

1:15pm - 2:45pm

- Shi, Kaiyu; Zhou, Yishun; Ebrahimi, Ali; Li, Gang; Iordachita, Ioan Iulian. *Optimization-based Concurrent Control of a High Dexterity Robot for Vitreoretinal Surgery*
- Zhang, Jintan; Yilmaz, Nural; Tumerdem, Ugur; Kazanzides, Peter. *Learning Based Estimation of 7 DOF Instrument and Grasping Forces on the da Vinci Research Kit*
- Wang, Junxiang; Wu, Ti; Iordachita, Ioan Iulian; Kazanzides, Peter. *Evaluation of a Motion Measurement System for PET Imaging Studies*
- Camargo, Jonathan; Bhakta, Krishan; Maldonado-Contreras, Jairo; Zhou, Sixu; Herrin, Kinsey; Young, Aaron. *OpenSim Model for Biomechanical Analysis with the Open-Source Bionic Leg*
- Palumbo, Maria Chiara; Morchi, Laura; Corbetta, Valentina; Menciassi, Arianna; De Momi, Elena; Votta, Emiliano; Redaelli, Alberto. *An Easy and User Independent Augmented Reality Based Navigation System for Radiation-Free Interventional Procedure*

Keynote

2:45pm - 3:45pm

Audrey Marshall,

Hospital for Sick Children, Toronto, Canada

3:45pm - 4:15pm

Break and Refreshments

Oral Presentations - Session 4

4:15pm - 5:15pm

- Trinh, Mai; Padhan, Jhasketan; Navkar, Nikhil; Deng, Zhigang. *Preliminary Design and Evaluation of an Interfacing Mechanism for Maneuvering Virtual Minimally Invasive Surgical Instruments*

- Abdurahiman, Nihal; Padhan, Jhasketan; Zhao, Haoran; Balakrishnan, Shidin; Al Ansari, Abdulla; Abinahed, Julien; Velasquez, Carlos; Becker, Aaron; Navkar, Nikhil. *Human-Computer Interfacing for Control of Angulated Scopes in Robotic Scope Assistant Systems*
- Puder, Andreas; Vetter, Andreas; Rumez, Marcel; Henle, Jacqueline; Sax, Eric. *A Mixed E/E-Architecture for Interconnected Operating Tables Inspired by the Automotive Industry*
- Oca, Siobhan; Havas, Jiselle; Bridgeman, Leila; Buckland, Daniel. *Durable Breast Phantom with Geometric and Mechanical Properties Approximating Human Tissue for Ultrasound Image and Robotic System Testing*

5:30pm - 7:30pm

2022 ISMR Banquet

Friday
April 15, 2022

Location: Marcus Nanotechnology Building

8:00am - 8:30am

Registration

Oral Presentations - Session 5

8:30am - 9:45am

- Bruns, T.L., Ramirez, A.A., Emerson, M.A., Lathrop, R.A., Mahoney, A.W., Gilbert, H.B., Liu, C.L., Russell, P.T., Labadie, R.F., Weaver, K.D. and Webster III, R.J.. *A modular, multi-arm concentric tube robot system with application to transnasal surgery for orbital tumors*
- Wang J, Peine J, Dupont PE. *Eccentric Tube Robots as Multiarmed Steerable Sheaths*
- H. SAEIDI J.D., OPFERMANN, M. KAM, S. WEI, S. LEONARD, M. H. HSIEH, J.U. KAMG , A. KRIEGER. *Autonomous robotic laparoscopic surgery for intestinal anastomosis*
- Amanov, E., Nguyen, T.D. and Burgner-Kahrs, J.. *Tendon-driven continuum robots with extensible sections—A model-based evaluation of path-following motions*
- Nuckols, R.W., Lee, S., Swaminathan, K., Orzel, D., Howe, R.D. and Walsh, C.J.. *Individualization of exosuit assistance based on measured muscle dynamics during versatile walking*

Keynote

9:45am - 10:45am

Michael Goldfarb,
Vanderbilt University, USA

10:45am - 11:15am

Break and Refreshments

Oral Presentations - Session 6

11:15am - 12:30pm

- Qiao Q, Borghesan G, De Schutter J, Vander Poorten E. *Force from Shape—Estimating the Location and Magnitude of the External Force on Flexible Instruments*
- Caulcrick, C., Huo, W., Franco, E., Mohammed, S., Hault, W. and Vaidyanathan, R.. *Model Predictive Control for Human-Centred Lower Limb Robotic Assistance*
- Gunderman A, Schmidt E, Morcos M, Tokuda J, Seethamraju RT, Halperin H, Viswanathan A, Chen Y.. *MR-Tracked Deflectable Stylet for Gynecologic Brachytherapy*
- Xiao, Boyang; Alamdar, Alireza; Song, Kefan; Ebrahimi, Ali; Gehlbach, Peter; Taylor, Russell H.; Iordachita, Ioan Iulian. *Delta Robot Kinematic Calibration for Precise Robot-Assisted Retinal Surgery*
- Liu, Wenjun; Pickett, Anna; Huang, Kevin; Su, Yun-Hsuan (Melody). *Camera Configuration Models for Machine Vision Based Force Estimation in Robot-Assisted Soft Body Manipulation*

12:30pm - 1:30pm

Lunch

Oral Presentations - Session 7

1:30pm - 2:45pm

- Battaglia, Edoardo; Kasman, Michael; Fey, Ann Majewicz. *Moving past Principal Component Analysis: Nonlinear Dimensionality Reduction towards Better Hand Pose Synthesis*
- Wu, Di; Zhang, Yao; OURAK, Mouloud; Ha, Xuan Thao; Niu, Kenan; Dankelman, Jenny; Vander Poorten, Emmanuel B. *Deep-learning-based Position Control of a Robotic Catheter under Environmental Contact*
- Ertop, Tayfun Efe; d'Almeida, Jesse; Amanov, Ernar; Shrand, Jason; Nimmagadda, Naren; Setia, Shaan; Kavoussi, Nicholas; Herrell, Duke; Webster III, Robert James. *Towards Suturing From Within the Urethra Using Concentric Tube Robots: First Experiences in Biological Tissues*
- Oghogho Jr, Martin Princeton; Sharifi, Mojtaba; Vukadin, Mia; Chin, Connor; Mushahwar, Vivian K.; Tavakoli, Mahdi. *Deep Reinforcement Learning for EMG-Based Control of Assistance Level in Upper-Limb Exoskeletons*
- Mehta, Ishaan; Hsueh, Hao Ya; Kourtzanidis, Nikolaos; Saeedi, Sajad. *Far-UVC Disinfection with Robotic Mobile Manipulator*

2:45pm - 3:15pm

Break and Refreshments

Oral Presentations - Session 8

3:15pm - 4:00pm

- Machaca, Sergio; Karachiwalla, Zulekha; Riazat, Naveed Dennis; Brown, Jeremy DeLaine. *Towards a ROS-based modular multi-modality haptic feedback system for robotic minimally invasive surgery training assessments*
- Padasdao, Blayton; Batsaikhan, Zolboo; Lafreniere, Samuel; Rabiei, Mahsa; Konh, Bardia. *Modeling and Operator Control of a Robotic Tool for Bidirectional Manipulation in Targeted Prostate Biopsy*
- Cho, Hang Man; Kang, Inseung; Park, Dongho; Molinaro, Dean; Young, Aaron. *Real-Time Walk Detection for Robotic Hip Exoskeleton Applications*

Closing Remarks

4:00pm - 4:15pm

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At Intuitive®, innovating for minimally invasive care is the passion that drives us. Our robotic-assisted da Vinci® Surgical System helps empower doctors and hospitals to make surgery less invasive than an open approach. Working with doctors and hospitals, we're continuing to develop new, minimally invasive surgical platforms and future diagnostic tools to help solve complex healthcare challenges around the world.



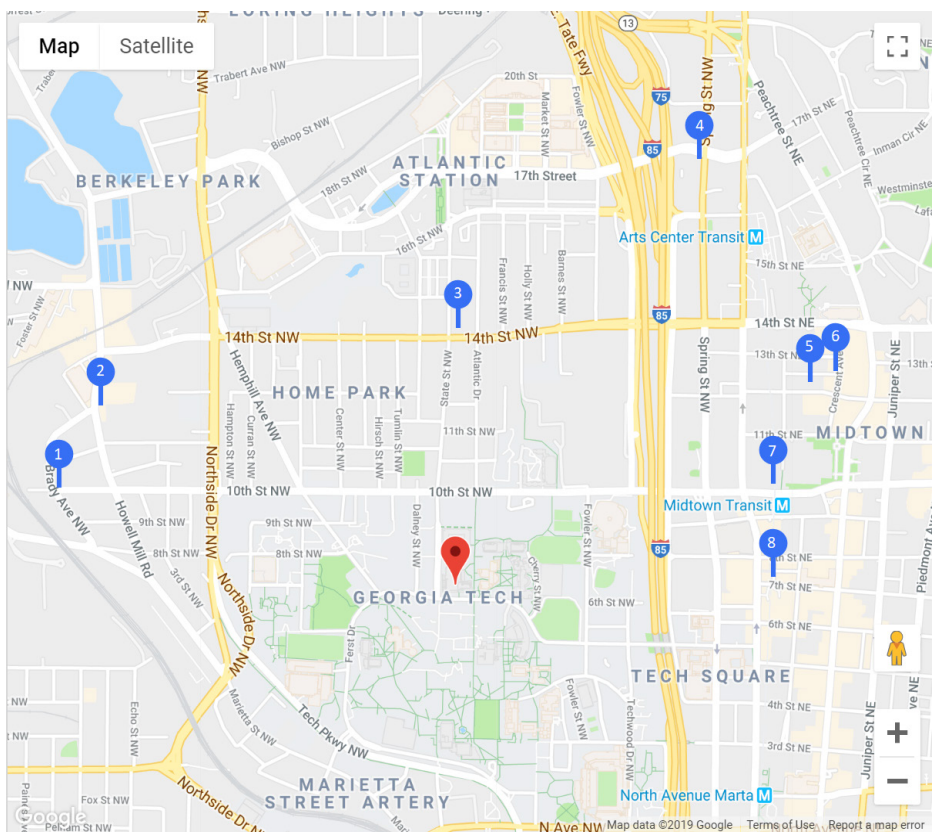
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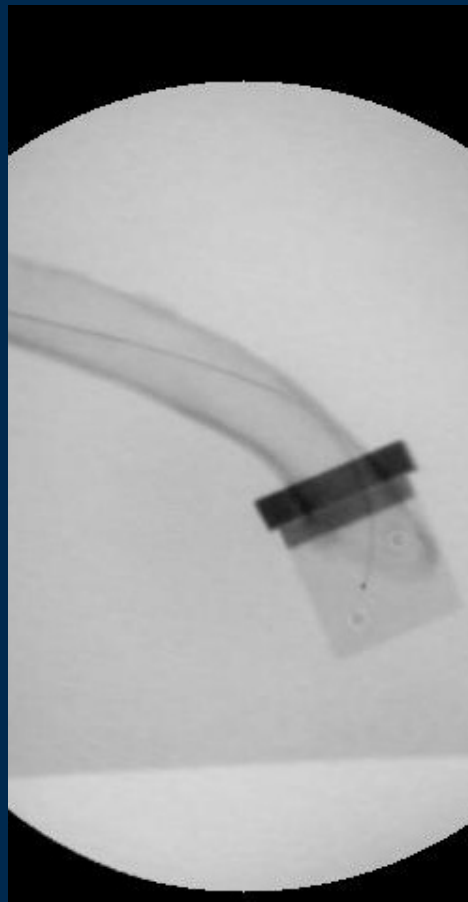
Notes

Notes

Restaurants



1. Miller Union - 999 Brady Ave. NW - American Restaurant - (678)733-8550
2. Barcelona Wine Bar - 1085 Howell Mill Rd. (Inside Westside Ironworks) - Spanish Restaurant - (404)872-8000
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