

2024 International Symposium on Medical Robotics (ISMР 2024)

Atlanta, Georgia, USA
3-5 June 2024



IEEE Catalog Number: CFP24N45-POD
ISBN: 979-8-3503-7712-5

**Copyright © 2024 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP24N45-POD
ISBN (Print-On-Demand):	979-8-3503-7712-5
ISBN (Online):	979-8-3503-7711-8
ISSN:	2831-3690

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Bayesian Optimization Based Preprocedural Planning for Robotic Left Atrial Appendage Occlusion.....	1
<i>Ran Hao, Yuttana Itsarachaiyot, M. Cenk Çavuçoglu</i>	
Theoretical Investigations on a Dynamic Hand Orthosis Based on a Prestressed Compliant Structure with Respect to Stiffness and Wrist-Forces.....	7
<i>Leon Schaeffer, David Herrmann, Valter Böhm</i>	
A Chain-Based Cable-Driven Upper-Limb Exoskeleton: Design, Mechanical Analysis and Development	14
<i>Yu Xian Lim, Mojtaba Sharifi</i>	
Accelerating Constrained Continual Learning with Dynamic Active Learning: A Study in Adaptive Speed Estimation for Lower-Limb Prostheses	21
<i>C. Johnson, J. Maldonado-Contreras, A. J. Young</i>	
Estimating the Joint Angles of an Articulated Microrobotic Instrument Using Optical Coherence Tomography.....	29
<i>Erik Fredin, Nirmal Pol, Anton Zaliznyi, Eric Diller, Lueder A. Kahrs</i>	
Design and Bench Demonstration of a Robotic System for Cervical Spine Deformity Surgery.....	36
<i>Ian Bales, Adam Reinsch, Brandon Sherrod, Marcus D. Mazur, Haohan Zhang</i>	
Model-Based Control for a Coupled Soft Robotic Exo-digit and Anthropomorphic Finger with Multi-Contact Point Physical Interaction	43
<i>Umme Kawsar Alam, Mahdi Haghshenas-Jaryani</i>	
Concentric Tube Robot-Based Intracerebral Hemorrhage Evacuation in Ex Vivo Sheep Head: A Comparative Study	49
<i>Joseph Sommer, Anthony L. Gunderman, Saikat Sengupta, Zhefeng Huang, Dimitri Sigouras, Kevin Cleary, Yue Chen</i>	
An FBG-Based Stiffness Estimation Sensor for In-vivo Diagnostics	56
<i>Behnam Moradkhani, Pejman Kheradmand, Harshith Jella, Kent K. Yamamoto, Alireza Tofangchi, Patrick J. Codd, Yash Chitalia</i>	
TAJ: A Platform for Integrating Tumor Detection and Depth Perception for Endoscopic Surgery.....	63
<i>Ali Fakhry, Thaison Le, Junzhe Zhang, Rui Li</i>	
HemoSet: The First Blood Segmentation Dataset for Automation of Hemostasis Management.....	70
<i>Albert J. Miao, Shan Lin, Jingpei Lu, Florian Richter, Benjamin Ostrander, Emily K. Funk, Ryan K. Orosco, Michael C. Yip</i>	
A Data-Driven Model with Hysteresis Compensation for I2RIS Robot.....	77
<i>Mojtaba Esfandiari, Yanlin Zhou, Shervin Dehghani, Muhammad Hadi, Adnan Munawar, Henry Phalen, David E. Usevitch, Peter Gehlbach, Iulian Iordachita</i>	
Intelligent Control of Prosthetic Leg for Gait Symmetry	84
<i>Zunaed Kibria, Sesh Commuri</i>	
3D Occupancy Reconstruction in Dynamic and Deforming Surgical Environments	92
<i>Om Shah, Yun-Hsuan Su</i>	

ROSurgical: An Open-Source Framework for Telesurgery	99
<i>Florian Heemeyer, Quentin Boehler, Fabio Leuenberger, Bradley J. Nelson</i>	
Towards Unified Shape and Biosensing: Multiplexing Tilted and Standard Fiber Bragg Gratings	106
<i>David Hanley, Kevin Dhaliwal, Mohsen Khadem</i>	
Variable Stiffness Soft Eversion Growing Robot Via Temperature Control of Low-Melting Point Alloy Pressurised Medium	113
<i>Shamsa Al Harthy, S. M. Hadi Sadati, Zicong Wu, Carlo A. Seneci, Christos Bergeles</i>	
Characterizing 3D Force Vectors to Improve the Assessment of Spasticity	120
<i>Zunaed Kibria, Sungjin Bae, Sourav Chandra, Matthieu Chardon, William Zev Rymer, Nina Suresh</i>	
Feasibility of Pointcloud-Based Ultrasound-CT Registration Towards Automated, Robot-Assisted Image-Guidance in Spine Surgery*	127
<i>Xihan Ma, Xiao Zhang, Yang Wang, Christopher Nycz, Arno Sungarian, Songbai Ji, Haichong K. Zhang</i>	
Low-Contact Grasping of Soft Tissue Using a Novel Vortex Gripper.....	134
<i>Roman Mykhailysyn, Ann Majewicz Fey</i>	
An Approach for Collaborative Robot-Assisted Endoscopic Lumbar Discectomy	140
<i>Giovanni Battista Regazzo, Ayoob Davoodi, Yuyu Cai, Ruixuan Li, Fabio Carrillo, Christoph J. Laux, Emmanuel Vander Poorten</i>	
Middle Tube Rotation of the COAST Guidewire Robot: Design and Modeling.....	147
<i>Sharan R. Ravigopal, Nidhi Malhotra, Timothy A. Brumfiel, Benjamin Chern, Yuanning Liu, Jaydev P. Desai</i>	
Expanding the Surgical Robotics Community: An Intuitive Sim-To-Real Control Framework for Raven-II with a Budget-Friendly Gamepad Controller	155
<i>Mai Bui, Natalie Chalfant, Cuiling Sun, Sean Fabrega, Haonan Peng, Kevin Huang, Yun-Hsuan Su</i>	
Towards the Development of a Tendon-Actuated Galvanometer for Endoscopic Surgical Laser Scanning	162
<i>Kent K. Yamamoto, Tanner J. Zachem, Behnam Moradkhani, Yash Chitalia,</i>	
Design of Transmission Tubes for Surgical Concentric Push-Pull Robots.....	169
<i>Khoa T. Dang, Stephen Qiu, Carter Hatch, Peter Connor, Tony Qin, Ron Alterovitz, Robert J. Webster III, Caleb Rucker</i>	
MR-Conditional Robotic Actuation of Concentric Tendon-Driven Cardiac Catheters	176
<i>Yifan Wang, Zheng Qiu, Junichi Tokuda, Ehud J. Schmidt, Aravindan Kolandaivelu, Yue Chen</i>	
Modeling Kinematic Uncertainty of Tendon-Driven Continuum Robots Via Mixture Density Networks	183
<i>Jordan Thompson, Brian Y. Cho, Daniel S. Brown, Alan Kuntz</i>	
Comprehensive Robotic Cholecystectomy Dataset (CRCD): Integrating Kinematics, Pedal Signals, and Endoscopic Videos.....	190
<i>Ki-Hwan Oh, Leonardo Borgioli, Alberto Mangano, Valentina Valle, Marco Di Pangrazio, Francesco Toti, Gioia Pozza, Luciano Ambrosini, Alvaro Ducas, Miloš Žefran, Liaohai Chen, Pier Cristoforo Julianotti</i>	

NeuroGAIN: Neuromechanical Generative Demand Forecasting Toward Optimal Control of Soft Hand Exoskeletons	197
<i>Avinash Baskaran, Sujata Basyal, Brendon C. Allen, Chad G. Rose</i>	
Enhancing Accuracy in Transendoscopic Concentric Tube Robots for Monocular Endoscope Guidance.....	203
<i>Jason Shrand, Jesse F. D'Almeida, Ethan Wilke, Amy Reed, Nicholas L. Kavoussi, S. Duke Herrell III, Tayfun Efe Ertop, Robert J. Webster III</i>	
Active Motion Cancellation for Robotic Optical Coherence Tomography of Moving Eyes: A Nystagmus Phantom Study.....	206
<i>Haochi Pan, Chae Woo Lim, Katelyn King, Renxiang Guan, Mark Draelos</i>	
Towards Biomechanical Evaluation of a Transformative Additively Manufactured Flexible Pedicle Screw for Robotic Spinal Fixation	213
<i>Yash Kulkarni, Susheela Sharma, Jordan P. Amadio, Farshid Alambeigi</i>	
Using Neural Networks to Model Hysteretic Kinematics in Tendon-Actuated Continuum Robots.....	219
<i>Yuan Wang, Max McCandless, Abdulhamit Donder, Giovanni Pittiglio, Behnam Moradkhani, Yash Chitalia, Pierre E. Dupont</i>	
Towards an Autonomous Minimally Invasive Spinal Fixation Surgery Using a Concentric Tube Steerable Drilling Robot.....	226
<i>Susheela Sharma, Sarah Go, Jeff Bonyun, Jordan P. Amadio, Mohsen Khadem, Farshid Alambeigi</i>	
Reward Learning from Suboptimal Demonstrations with Applications in Surgical Electrocautery.....	232
<i>Zohre Karimi, Shing-Hei Ho, Bao Thach, Alan Kuntz, Daniel S. Brown</i>	
Manufacturing and Design Improvements of an Evertng Airway Device Prototype	239
<i>Grace O'Connor, Andrew Lewis, Alex Gong, Daniel M. Burke, Blake Hannaford</i>	
Transformer-Based Automated Skill Assessment and Interpretation in Robot-Assisted Surgery	246
<i>Yi Zheng, Ann Majewicz-Fey</i>	
Improving the Realism of Robotic Surgery Simulation Through Injection of Learning-Based Estimated Errors	254
<i>Juan Antonio Barragan, Hisashi Ishida, Adnan Munawar, Peter Kazanzides</i>	
Towards a Robotically Steerable Laser Ablation Probe	261
<i>Julio Adrian Ceja, Saeed Rezaeian, J. Rodrigo Vélez-Cordero, Juan Hernández-Cordero, Behnam Badie, Jun Sheng</i>	
STITCH: Augmented Dexterity for Suture Throws Including Thread Coordination and Handoffs	268
<i>Kush Hari, Hansoul Kim, Will Panitch, Kishore Srinivas, Vincent Schorp, Karthik Dharmarajan, Shreya Ganti, Tara Sadjadpour, Ken Goldberg</i>	
On the Potentials of Utilizing a Handheld Bioprinter for in Vivo Treatment of Volumetric Muscle Loss Injuries	275
<i>Omid Rezayof, Susheela Sharma, Meenakshi Kamaraj, Johnson V. John, Farshid Alambeigi</i>	
Suturing Tasks Automation Based on Skills Learned from Demonstrations: A Simulation Study.....	281
<i>Haoying Zhou, Yiwei Jiang, Shang Gao, Shiyue Wang, Peter Kazanzides, Gregory S. Fischer</i>	

Author Index