

IEEE ICMA 2026 Conference Workshop

IEEE Women in Engineering Event

World Premium Workshops on Mechatronics and Robotics

Sunday, August 2, 2026

13:30 - 15:00

Ballroom 3, 2F

Shangri-La Hotel, Changchun, Jilin, China

Robotics for Medical and Rehabilitation Applications

Venue: Ballroom 3

2F, Shangri-La Hotel, Changchun

Date and Time: 13:30 - 15:00, August 2, 2026

Organizers:

Prof. Mei Feng, Professor and PhD Supervisor, Jilin University, National-Level Young Talent, Jilin Provincial High-Level Talent, Head of the Jilin Provincial Rehabilitation Assistive Device R&D Studio, and Leader of the Changchun Industry-University-Research Innovation Team.

About the workshop:

This IEEE Women in Engineering Event focuses on innovation, technology translation, and female leadership in medical and rehabilitation robotics. It brings together distinguished women from academia, industry, and clinical practice to discuss advances in robotic technologies, product development, regulatory approval, entrepreneurship, and the translation of academic research into practical healthcare solutions.

Through panel discussion, interactive dialogue, and networking activities, the event aims to highlight women's contributions to mechatronics and medical robotics, promote collaboration across engineering, healthcare, and industry, and provide mentoring opportunities for students and early-career researchers. It also seeks to inspire more young women to pursue careers in robotics, advanced manufacturing, and healthcare technology while strengthening diversity and inclusion within the IEEE RAS/WIE community.

List of Speakers and Schedule

Time	Topics	Speaker List
13:30-13:35	Welcome Speech	Prof. Mei Feng Professor and PhD Supervisor, Jilin University National-Level Young Talent Jilin Provincial High-Level Talent
13:35-13:50	Embodied Intelligence-Driven Autonomous Soft-Tissue Manipulation for Surgical Robots	Prof. Qi Dou Associate Professor Department of Computer Science and Engineering The Chinese University of Hong Kong PhD Supervisor · National Young Talent
13:50-14:05	Synergistic Rehabilitation System Integrating Exoskeleton and TEAS Based on Continuous sEMG Decoding	Dr. He Li Assistant Researcher Institute of Acupuncture and Moxibustion First Teaching Hospital of Tianjin University of Traditional Chinese Medicine PhD · Beijing Institute of Technology (2025)
14:05-14:20	Stent Design and Information Sensing for Thrombectomy Procedures	Prof. Shengnan Lv Professor School of Mechanical Engineering and Automation Beihang University National Young Talent
14:20-14:35	Deformable Object Manipulation for Home Robots	Prof. Yixing Gao Associate Professor School of Artificial Intelligence, Jilin University CAST Young Talents Support Program IEEE ICRA 2024 New Generation Star Project
14:35-14:50	Exploration of Medical Robotics Research and Technology Transfer	Prof. Mei Feng Professor, Jilin University PhD Supervisor · National-Level Young Talent Jilin Provincial High-Level Talent
14:50-15:00	Discussion Q and A	All speakers

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Robotics for Medical and Rehabilitation Applications

Workshop Talk 1

**Embodied Intelligence-Driven Autonomous Soft-Tissue
Manipulation for Surgical Robots**

Qi Dou

Associate Professor
Department of Computer Science and Engineering
The Chinese University of Hong Kong
PhD Supervisor · National Young Talent



Abstract:

China's rapidly aging population is increasing pressure on traditional healthcare systems, while embodied intelligence offers new opportunities for medical robotics. This talk presents our recent work on embodied-intelligence-driven autonomous laparoscopic surgery. It introduces SurRoL, our fully developed surgical-robotics simulator, and VPPV, a perception-and-decision framework built upon it. Together, they enable generalizable autonomous soft-tissue manipulation, including tissue retraction and vascular clipping. The talk will also examine key technical challenges, future directions in medical embodied intelligence, and lessons from our ongoing research.

Qi Dou is an Associate Professor in Computer Science and Engineering at The Chinese University of Hong Kong, a PhD supervisor, and a young talent scholar. Her research spans artificial intelligence, robotics, and healthcare, emphasizing intelligent surgical robots, smart healthcare, and safe embodied intelligence. She received the CUHK Young Researcher Achievement Award (2025) and Exemplary Teaching Award (2022). She serves as Associate Director of the CUHK Institute of Intelligent Medical and Extended Reality and holds roles at the T Stone Robotics Institute and two InnoHK robotics centres. Her honors include the IEEE EMBS Early Career Achievement Award, the He Xiangjian Young Scientist Award, and the Hong Kong Young Scientist Award. She has published over 100 papers, with more than 40,000 Google Scholar citations and an h-index of 80. Her work has received MICCAI, ICRA, TBME, and MedIA paper awards. She is an associate editor, area chair for NeurIPS, ICML, ICRA, and CVPR, and General Co-Chair of MICCAI 2026.

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Workshop Talk 2

**Synergistic Rehabilitation System Integrating Exoskeleton
and TEAS Based on Continuous sEMG Decoding**

He Li

Assistant Researcher
Institute of Acupuncture and Moxibustion
First Teaching Hospital of Tianjin University of Traditional Chinese Medicine
PhD · Beijing Institute of Technology (2025)



Abstract:

Post-stroke motor recovery requires coordinated central neuroplasticity and peripheral motor execution. Existing devices often provide mechanical assistance or fixed open-loop electrical stimulation separately. This talk presents a synergistic rehabilitation system integrating motor assistance with transcutaneous electrical acupoint stimulation (TEAS) through continuous surface EMG decoding. Based on bilateral rehabilitation, multimodal signals from the healthy limb are used to infer motion intention and extract muscle activation and angular velocity. Two parallel pathways then provide synchronous actuator assistance and dynamically adjust TEAS intensity and frequency. Preliminary tests demonstrate low-latency closed-loop communication and stable multi-terminal control, supporting intelligent and personalized neurorehabilitation.

He Li holds a Ph.D. in Biomedical Engineering from the School of Life Sciences, Beijing Institute of Technology (2025). She is an Assistant Researcher at the Institute of Acupuncture and Moxibustion, First Teaching Hospital of Tianjin University of Traditional Chinese Medicine. Her research covers intelligent rehabilitation and biomedical signal processing, including sEMG-driven upper-limb exoskeletons, cloud-based home telerehabilitation, multi-sensor fusion, and transcutaneous acupoint electrical stimulation. She has published 10 first-author SCI papers in journals including IEEE JBHI, IEEE IoTJ, IEEE TIM, and IEEE RAL, and works to translate rehabilitation technologies into practical personalized home-based solutions.

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Workshop Talk 3

Stent Design and Information Sensing for Thrombectomy Procedures

Shengnan Lv

Professor

School of Mechanical Engineering and Automation

Beihang University

National Young Talent



Abstract:

This talk addresses poor adaptability to complex cerebral vasculature and insufficient real-time, radiation-free sensing in minimally invasive thrombectomy. A miniature robot uses a superelastic nitinol mesh stent and differentially controlled pretensioned tendons for programmable radial expansion and axial deflection. A segmented closed-cell topology with an anti-escape structure, together with parametric and multi-objective optimization, supports anti-fracture design. In vitro experiments verify functionality and mechanical robustness. Flexible fiber Bragg grating sensors enable in situ thrombus characterization and three-dimensional vascular reconstruction. Animal experiments demonstrate high accuracy and good MRI compatibility, providing an integrated solution for precise, radiation-free endovascular thrombectomy.

Shengnan Lv is a Professor at the School of Mechanical Engineering and Automation, Beihang University, and a nationally recognized young talent. Her research focuses on deployable space mechanisms and their applications in aerospace and medical engineering. She has published more than 70 papers in leading journals and international conferences, including the International Journal of Mechanical Sciences, Mechanism and Machine Theory, and IEEE Transactions on Mechatronics. Her distinctions include a Best Paper Nomination at the IFToMM World Congress and the Best Paper Award at the IEEE/IFToMM ReMAR International Conference. She serves on the Academic Committee of the National Key Laboratory of Aerospace Mechanisms and the editorial board of The International Journal of Robotics Research (IJRR).

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Workshop Talk 4
Deformable Object Manipulation for Home Robots

Yixing Gao

Associate Professor
School of Artificial Intelligence
Jilin University
CAST Young Talents Support Program
IEEE ICRA 2024 New Generation Star Project



Abstract:

Deformable object manipulation is a fundamental capability for next-generation home robots, enabling assistance in garment handling, household organization, and elderly care. Unlike rigid objects, deformable objects exhibit complex geometries and dynamic physical behaviors that challenge robotic perception and manipulation. This talk presents recent advances in robot learning for robust and generalizable deformable object manipulation, including garment perception and grasping under diverse conditions such as low-light scenarios, together with simulation-driven methods for scalable training and evaluation. These advances support reliable and versatile home-robot manipulation in everyday environments.

Yixing Gao is an Associate Professor at the School of Artificial Intelligence, Jilin University, where she leads the Humanoid Robotics and Vision Laboratory. She is a recipient of the 10th Young Talents Support Program of the China Association for Science and Technology and the only female recipient from China in the IEEE ICRA 2024 New Generation Star Project. Admitted to Xi'an Jiaotong University's Special Class for the Gifted Young at age 15, she earned her Ph.D. from Imperial College London and later conducted postdoctoral research there before serving as a Teaching Fellow at the University of Birmingham. Her research interests include embodied intelligence, assistive robotics, computer vision, and human-robot interaction. Her work has been supported by the NSFC Young Scientists Fund, an NSFC-Royal Society cooperation grant, and a Jilin Provincial Key R&D project. She led the IROS 2025 ROMADO workshop and served as General Chair of IEEE CIS-RAM 2026.

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Workshop Talk 5

**Exploration of Medical Robotics Research and
Technology Transfer**

Mei Feng

Professor

Jilin University

PhD Supervisor · National-Level Young Talent

Jilin Provincial High-Level Talent



Abstract:

This talk introduces the team's work in medical robotics research and technology transfer. Topics include autonomous surgery for minimally invasive surgical robots, highly dexterous minimally invasive instruments, intelligent navigation for fracture-reduction robots, and the development and transfer of upper- and lower-limb joint rehabilitation robots.

Mei Feng is a Professor and PhD supervisor at Jilin University, a national-level young talent, and a Jilin Provincial High-Level Talent. She serves in the Chinese Association for Artificial Intelligence and the Management Branch of the China Association of Medical Equipment, heads the Jilin Provincial Rehabilitation Assistive Device R&D Studio, and leads a Changchun industry-university-research innovation team. Her research focuses on intelligent medical bionic robots. She has led 32 national and provincial or ministerial projects, published more than 30 first- or corresponding-author papers, edited five monographs, and obtained over 100 national invention patents and related intellectual-property rights, including eight transferred patents. Her awards include the Second Prize of the Jilin Provincial Science and Technology Progress Award, the Gold Award of the Northeast Revitalization Design Award, and the First Prize of the Jilin Provincial Mechanical Industry Science and Technology Award.