

## Education

- 2021 – present **Ph.D., Control Systems**, University of Alberta, Edmonton, Canada.  
Supervisor: Dr. Mahdi Tavakoli. GPA: 4.0.
- 2017 – 2021 **Bachelor of Engineering, Mechanical Design, Manufacturing and Automation**,  
University of Electronic Science and Technology of China, Chengdu, China.  
GPA: 3.98.

## Publications

### Journal Articles

- 2024 **Yafei Ou** and Mahdi Tavakoli. Autonomous soft-tissue needle steering using reinforcement learning guided by human input. *Journal of Medical Robotics Research (JMRR)*, page 2440010. World Scientific Publishing Company, 2024.
- 2024 **Yafei Ou**, Abed Soleymani, Xingyu Li, and Mahdi Tavakoli. Autonomous blood suction for robot-assisted surgery: A sim-to-real reinforcement learning approach. *IEEE Robotics and Automation Letters (RA-L)*, volume 9, pages 7246–7253. IEEE, 2024.
- 2024 Abed Soleymani, Mahdi Tavakoli, Aghazadeh Farzad, **Yafei Ou**, Rouhani Hossein, Bin Zheng, and Xingyu Li. Hands collaboration evaluation for surgical skills assessment: An information theoretical approach. *IEEE Transactions on Medical Robotics and Bionics (T-MRB)*. IEEE, 2024.
- 2024 Teng Li, Amir Zakerimanesh, **Yafei Ou**, Badre Armin, and Mahdi Tavakoli. Iterative learning for gravity compensation in impedance control. *IEEE/ASME Transactions on Mechatronics (TMECH)*, pages 1–12. World Scientific Publishing Company, 2024.
- 2023 **Yafei Ou**, Sadra Zargarzadeh, and Mahdi Tavakoli. Robot learning incorporating human interventions in the real world for autonomous surgical endoscopic camera control. *Journal of Medical Robotics Research (JMRR)*, volume 8, pages 2340004–1, 2023.
- 2023 **Yafei Ou** and Mahdi Tavakoli. Sim-to-real surgical robot learning and autonomous planning for internal tissue points manipulation using reinforcement learning. *IEEE Robotics and Automation Letters (RA-L)*, volume 8, pages 2502–2509. IEEE, 2023.

### Conference Papers

- 2024 **Yafei Ou**, Sadra Zargarzadeh, Paniz Sedighi, and Mahdi Tavakoli. A realistic surgical simulator for non-rigid and contact-rich manipulation in surgeries with the da vinci research kit. In *21st International Conference on Ubiquitous Robots (UR)*. IEEE, 2024.
- 2023 **Yafei Ou** and Mahdi Tavakoli. Towards safe and efficient reinforcement learning for surgical robots using real-time human supervision and demonstration. In *2023 International Symposium on Medical Robotics (ISMR)*, pages 1–7. IEEE, 2023.

### Manuscripts in Preparation

- 2024 Sadra Zargarzadeh, Maryam Mirzaei, **Yafei Ou**, and Mahdi Tavakoli. From decision to action in surgical autonomy: Multi-modal large language models for robot-assisted blood suction. *arXiv preprint arXiv:2408.07806*, 2024. submitted.
- 2024 Abed Soleymani, **Yafei Ou**, Xingyu Li, and Mahdi Tavakoli. Vaps: Encoding of human movement characteristics for dexterous robot trajectory generation. 2024. in progress.
- 2024 Yi Hu, **Yafei Ou**, August Sieben, Zahra Samadikhoshkho, Bin Zheng, and Mahdi Tavakoli. Surgical robot learning from imperfect demonstrations. 2024. submitted.

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## Awards & Scholarships

- 2024 **Floyd Derkat Graduate Award in Artificial Intelligence and Machine Learning**, *University of Alberta*, \$5,000.
- 2024 – 2025 **Stephen and Olga Anhill Graduate Scholarship in Electrical and Computer Engineering**, *University of Alberta*, \$12,000.
- 2023 – 2025 **Alberta Innovates Graduate Student Scholarship (AI GSS)**, *Alberta Innovates*, \$31,000 (Actual: \$12,000), annually for 2 years.  
Awarded as a supplementary top-up amount due to holding another major award.
- 2021 – 2025 **CSC Ph.D. Scholarship**, *China Scholarship Council*, \$26,400, annually for 4 years.

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## Academic Activities and Positions

- 2023 **Research Assistant**, *Department of ECE, University of Alberta*.
- Winter 2023 **Teaching Assistant**, *ECE 760: Robotics: Modelling, Planning and Control*.
- Winter 2023 **Scholarship Of Pedagogy and Application Of Research Knowledge - Engineering (SPARK-ENG)**, certificate acquired.
- Reviewed manuscripts for** IEEE Robotics and Automation Letters (RA-L), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), International Symposium on Medical Robotics (ISMR), among others.
- Oral and poster presentations at** Autonomous Systems Initiative (ASI) Symposium (University of Alberta, 2023), Biomedical Engineering Research Day (University of Alberta, 2024), among others.

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## Computer Skills

**General-purpose programming:** Python, C#, C, C++, MATLAB  
**Control system design and simulation:** MATLAB, Simulink  
**Robotics:** ROS, Robotics Toolbox for MATLAB/Python, OpenCV  
**Machine learning:** PyTorch, NumPy, scikit-learn, ONNX  
**Video game and virtual reality:** Unity, PhysX, HLSL  
**3D modelling:** Creo, SolidWorks, Blender

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## Languages

English (Proficient)  
Chinese (Native)