

Keyu Li

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Research Interest

My research interests include artificial intelligence and its application in robot decision-making. I am currently working on reinforcement learning algorithms for medical robotic systems.

Education

- **The Chinese University of Hong Kong**, Hong Kong **August 2019 – Present**
Ph.D., Department of Electronic Engineering
Advisor: Prof. Max Q.-H. Meng
- **Harbin Institute of Technology**, Weihai, China **September 2015 – July 2019**
B.Eng. Department of Information Science and Engineering
GPA: 95.15 / 100 Rank: 1 / 106

Employment

- **The Chinese University of Hong Kong**, Hong Kong **February 2019 – May 2019**
Research Assistant, Department of Electronic Engineering.
Conducted research on reinforcement learning algorithms for mobile robot navigation in dense crowds.
- **Tencent**, Shenzhen, China **July 2018 – August 2018**
Intern, Tencent Youtu Lab. Conducted research on deep learning algorithms for commodity identification and retrieval from videos.

Honors & Awards

- **Hong Kong Ph.D. Fellowship** **2019 – Present**
Awarded to 250 Ph.D. students that study in Hong Kong by the Research Grants Council (RGC) of Hong Kong. Eligibility: outstanding qualities of academic performance, research ability / potential, communication and interpersonal skills, and leadership abilities.
- **Top 10 teams in MineRL 2020 Competition (Round 1)** **2020**
Our team "CU-SF" ranked 4th among 95 teams, for work on sample-efficient reinforcement learning algorithms to solve complex, hierarchical, and sparse environments.
- **MIIT Innovation and Entrepreneurship Scholarship (Third-class)** **2019**
Awarded to 210 students nationwide by the Ministry of Industry and Information Technology (MIIT), China.

- **Outstanding Graduate of Shandong Province** 2019
Awarded to 5% of graduates in Shandong Province.
- **Outstanding Student of Shandong Province** 2018
Awarded to 0.1% of undergraduate students in Shandong Province.
- **Top Ten Undergraduates Award & Ma Zuguang Scholarship** 2018
Awarded to 10 undergraduate students (0.1%) at Harbin Institute of Technology, Weihai.
- **China National Scholarship** 2018, 2017, 2016
Highest scholarship in China, awarded to top 0.2% by the Ministry of Education.
- **Top Prize in National English Competition for College Students (NECCS)** 2018, 2016
Awarded to 0.1% of participants.
- **Honorable Mention in Interdisciplinary Contest in Modeling (ICM) for American College Students** 2017
Awarded to 25% of teams.
- **First Prize in the Chinese Mathematics Competitions (CMC)** 2016
Awarded to 5% of participants.

Publications

(* indicates equal contribution)

- **Unsupervised Learning based Relative Localization for WCE in a Deformable Tubular Environment**
Yangxin Xu, **Keyu Li**, Max Qing-Hu Meng
IEEE International Conference on Advanced Robotics and Mechatronics (ICARM), 2021
- **A Design Approach of 3D Optimal Mobile Sensor Array for Confidence-box based Tracking of a Magnetic Capsule**
Yangxin Xu, **Keyu Li**, Ziqi Zhao, Max Qing-Hu Meng
IEEE International Conference on Advanced Robotics and Mechatronics (ICARM), 2021
- **Autonomous Navigation of an Ultrasound Probe Towards Standard Scan Planes with Deep Reinforcement Learning**
Keyu Li, Jian Wang, Yangxin Xu, Hao Qin, Dongsheng Liu, Li Liu, Max Qing-Hu Meng
IEEE International Conference on Robotics and Automation (ICRA), 2021
- **An Overview of Systems and Techniques for Autonomous Robotic Ultrasound Acquisitions**
Keyu Li, Yangxin Xu, Max Qing-Hu Meng
IEEE Transactions on Medical Robotics and Bionics (T-MRB), 2021
- **Autonomous Navigation of an Ultrasound Probe Towards Standard Scan Planes with Deep Reinforcement Learning**
Keyu Li, Jian Wang, Yangxin Xu, Hao Qin, Dongsheng Liu, Li Liu, Max Qing-Hu Meng
IEEE International Conference on Robotics and Automation (ICRA), 2021

- **Reciprocally Rotating Magnetic Actuation and Automatic Trajectory Following for Wireless Capsule endoscopy**
Yangxin Xu*, **Keyu Li***, Ziqi Zhao, Fei Meng, Li Liu, Max Qing-Hu Meng
IEEE International Conference on Robotics and Automation (ICRA), 2021
- **A Novel System for Closed-loop Simultaneous Magnetic Actuation and Localization of WCE based on External Sensors and Rotating Actuation**
Yangxin Xu, **Keyu Li**, Ziqi Zhao, Max Qing-Hu Meng
IEEE Transactions on Automation Science and Engineering (T-ASE), 2020
- **Improved Multiple Objects Tracking based Autonomous Simultaneous Magnetic Actuation & Localization for WCE**
Yangxin Xu, **Keyu Li**, Ziqi Zhao, Max Qing-Hu Meng
IEEE International Conference on Robotics and Automation (ICRA), 2020
- **A Novel Approach for Automatic State Detection of A Magnetically Actuated Capsule**
Yangxin Xu, **Keyu Li**, Max Qing-Hu Meng
International Engineering in Medicine and Biology Conference (EMBC), 2020
- **Towards External Sensor based Simultaneous Magnetic Actuation and Localization for WCE**
Yangxin Xu, Ziqi Zhao, **Keyu Li**, Max Qing-Hu Meng
IEEE International Conference on Robotics and Biomimetics (ROBIO), 2019
- **SARL*: Deep Reinforcement Learning based Human-Aware Navigation for Mobile Robot in Indoor Environments**
Keyu Li, Yangxin Xu, Jiankun Wang, Max Qing-Hu Meng
IEEE International Conference on Robotics and Biomimetics (ROBIO), 2019
- **An Identification Algorithm for Underwater Vehicle Infrared Wake Based on GLCM Minimum Difference of Entropy**
Haoxian Wang, Heng Dong, **Keyu Li**, Zhiquan Zhou
IEEE International Conference on Instrumentation & Measurement, Computer, Communication and Control (IMCCC), 2018.
- **Estimation Method for Microbial Count Based on Image Processing**
Keyu Li, Haoxian Wang
Journal of Harbin University of Commerce (Natural Sciences Edition), 2018

Patents

- **CN112515611A: Localization method, device and terminal equipment for wireless capsule endoscopy**
MengLi Aili, Xu Yangxin, **Li Keyu**, Zhao Ziqi, Zhou Yue
Public Review Date: 2021.03.19
- **CN112515610A: Actuation method, device and system for wireless capsule endoscopy**
MengLi Aili, Xu Yangxin, **Li Keyu**, Zhao Ziqi, Zhou Yue
Public Review Date: 2021.03.19
- **CN112493970A: Localization method and system for wireless capsule endoscopy**
MengLi Aili, Xu Yangxin, **Li Keyu**, Zhao Ziqi, Zhou Yue
Public Review Date: 2021.03.16

- **CN107644210B: Microbe quantity estimation method based on image processing**
Wang Haoxian, Zhou Zhiquan, Li Keyu
Publication date: 2020.05.12

Professional Activities & Service

- **Reviewer** 2021
2021 IEEE International Conference on Advanced Robotics and Mechatronics (ICARM)
- **Reviewer** 2021
2021 IEEE International Conference on Intelligent Robots and Systems (IROS)
- **Reviewer** 2021
2021 IEEE International Conference on Robotics and Automation (ICRA)
- **Participant** 2021
Our team won 4th place in MineRL 2020 Competition (Round 1) and presented our work at the MineRL 2020 Competition Workshop at NeurIPS 2020.
- **Delegate reviewer** 2020
2020 IEEE International Conference on Intelligent Robots and Systems (IROS)
- **Session Chair & Reviewer** 2019
2019 IEEE International Conference on Robotics and Biomimetics (ROBIO)

Teaching Experience

- **Teaching Assistant at CUHK** 2020 – 2021, Term 2
Tutorial on course ELEG3103: Robotic Perception & Intelligence
- **Teaching Assistant at CUHK** 2020 – 2021, Term 1
Tutorial on course ELEG4701: Intelligent Interactive Robot
- **Teaching Assistant at CUHK** 2019 – 2020, Term 2
Tutorial on course ELEG3103: Robotic Perception & Intelligence
- **Teaching Assistant at CUHK** 2019 – 2020, Term 1
Tutorial on course ELEG4701: Intelligent Interactive Robot

Professional Skills

- **Programming skills:** Python, MATLAB, C, Assembly, LaTeX, HTML.
- **Tools:** Tensorflow, PyTorch, ROS, Multisim, HFSS, Protel, Auto CAD, etc.
- **Language:** TOEFL 104.