Curriculum Vitae

LEI TAI

CONTACT INFORMATION	CYT2014 Robotics Institute, HKUST Clear Water Bay, Hong Kong	Email: ltai@connect.ust.hk Web: http://onlytailei.github.io github: https://github.com/onlytailei

EDUCATION

Hong Kong University of Science and Technology, Hong Kong SAR, China P.R.

PhD in Electronic & Computer Engineering.   Sept. 2014 - present
- Research Interests: *Mobile Robotics, Deep Learning, Deep Reinforcement Learning*
- Advisor: Prof. Ming Liu

University of Freiburg, Germany

Visiting Scholar in Autonomous Intelligent Systems Lab   Mar. 2017 - Jan. 2018
- Advisor: Prof. Dr. Wolfram Burgard

Harbin Institute of Technology , Harbin, China P.R.

M.S. in Engineering.   Sep. 2012 - Jun. 2014
- GPA: 81.20/100 (Top 30%).

B.S. in Engineering.   Sep. 2008 - Jun. 2012
- GPA: 88.17/100, (Top 10%).

WORKING AND RESEARCH EXPERIENCE

Research in sensorimotor learning RAM Lab   Aug. 2015 - present
- Sensorimotor learning for both indoor and outdoor robot navigation.
- Improve autonomous driving through human gaze learning.
- 3D point cloud perception including detection and segmentation.

Research in deep RL for robotics AIS Lab   Mar. 2017 - Jan. 2018
- Generalized deep reinforcement learning with external memory and prediction ability.
- Socially compliant navigation in crowded environment.
- Visual domain adaptation for learning-based visual control policies.

Algorithm R&D Intern Xiangji Keji (MLOG), Beijing   June. 2015 - Aug. 2015
- Nowcast precipitation prediction through radar echo images with deep learning.
- Optical flow estimation and motion tracking of the radar images for Tian Qi Jia.

PUBLICATIONS

Journals

1. Jingwei Zhang*, **Lei Tai***, Peng Yun, Yufeng Xiong, Ming Liu, Joschka Boedecker, Wolfram Burgard, "VR Goggles for Robots: Real-to-sim Domain Adaptation for Visual Control", (* indicates equal contribution), *IEEE Robotics and Automation Letters (RA-L)*, 2019.

2. Peng Yun, **Lei Tai**, Yuan Wang, Ming Liu, "Focal Loss in 3D Object Detection", *IEEE Robotics and Automation Letters (RA-L)*, 2019.

3. **Lei Tai**, Shaohua Li, Ming Liu, "Autonomous Exploration of Mobile Robots through Deep Neural Networks", *International Journal of Advanced Robotic Systems (IJARS)*, 2017.

4. **Lei Tai**, Ming Liu, "Mobile Robots Exploration through CNN-based Reinforcement Learning", *Robotics and Biomimetics*, 2016.

Conferences

1. **Lei Tai**, Peng Yun, Yuying Chen, Congcong Liu, Haoyang Ye, Ming Liu, "Visual-based Autonomous Driving Deployment from a Stochastic and Uncertainty-aware Perspective", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019.

2. Yuying Chen*, Congcong Liu*, **Lei Tai**, Ming Liu, Bertram Shi, "Gaze Training by Modulated Dropout Improves Imitation Learning". *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019.

3. Congcong Liu*, Yuying Chen*, **Lei Tai**, Ming Liu, Bertram Shi, "Utilizing Eye Gaze to Enhance the Generalization of Imitation Network to Unseen Environments", *International Conference on Machine Learing (ICML) Workshop*, 2019.

4. Congcong Liu*, Yuying Chen*, **Lei Tai**, Haoyang Ye, Ming Liu, Bertram Shi, "A Gaze Model Improves Autonomous Driving", *ACM Symposium on Eye Tracking Research & Applications (ETRA)*, 2019.

5. **Lei Tai**, Jingwei Zhang, Ming Liu, Wolfram Burgard, "Socially-compliant Navigation through Raw Depth Inputs with Generative Adversarial Imitation Learning", *International Conference on Robotics and Automation (ICRA)*, 2018.

6. Oleksii Zhelo, Jingwei Zhang, **Lei Tai**, Ming Liu, Wolfram Burgard, "Curiosity-driven Exploration for Mapless Navigation with Deep Reinforcement Learning", *International Conference on Robotics and Automation (ICRA) Workshop*, 2018.

7. **Lei Tai**, Giuseppe Paolo, and Ming Liu, "Virtual-to-real Deep Reinforcement Learning: Continuous Control of Mobile Robots for Mapless Navigation, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2017.

8. **Lei Tai**, Haoyang Ye, Qiong Ye, Ming Liu, "PCA-aided Fully Convolutional Networks for Semantic Segmentation of Multi-channel fMRI", *International Conference on Advanced Robotics (ICAR)*, 2017.

9. **Lei Tai**, Shaohua Li, and Ming Liu, "A Deep-Network Solution Towards Model-less Obstacle Avoidence", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2016.

10. **Lei Tai**, Ming Liu, "A Robot Exploration Strategy Based on Q-learning Network", *IEEE International Conference on Real-time Computing and Robotics (RCAR)*, 2016.

PREPRINT
PUBLICATIONS

1. Jingwei Zhang, **Lei Tai**, Joschka Boedecker, Wolfram Burgard, Ming Liu, "Neural SLAM: Learning to Explore with External Memory".

2. **Lei Tai***, Jingwei Zhang*, Ming Liu, Joschka Boedecker, Wolfram Burgard, "A Survey of Deep Network Solutions for Learning Control in Robotics: From Reinforcement to Imitation". (* indicates equal contribution).

3. **Lei Tai**, Ming Liu, "Towards cognitive exploration through deep reinforcement learning for mobile robots".

AWARDS

Paper Awards
- ICAR Best Student Paper Award, Hong Kong — July 2017

Contest Awards
- 5th in 2016 Cybathlon Powered Wheelchair Race, Zurich, Switzerland — Oct 2016
- Runner-up of 2014 ABU Robocon, Zoucheng, China — June 2014
- Best Technology of 2012 ABU Robocon, Harbin, China — June 2012
- Honorable Mention of Mathematical Contest in Modeling — Mar 2011

TEACHING EXPERIENCE	Teaching Assistant	Spring 2019
	ELEC 1010: Electronic and Information Technology	
	Instructor: Prof. Kei May Lau	
	ECE Department, Hong Kong University of Science and Technology	
	Teaching Assistant	Fall 2018
	ELEC 1010: Electronic and Information Technology	
	Instructor: Prof. George Jie Yuan	
	ECE Department, Hong Kong University of Science and Technology	
	Teaching Assistant	Spring 2015
	ELEC 3200: System Modeling, Analysis and Control	
	Instructor: Prof. Ling Shi	
	ECE Department, Hong Kong University of Science and Technology	

ACADEMIC ACTIVITIES

Referee Services
- *Autonomous Robots (AURO).*
- *IEEE Transactions on Neural Networks and Learning Systems (NNLS).*
- *IEEE Robotics and Automation Letters (RA-L).*
- *International Journal of Advanced Robotic Systems, (IJARS).*
- *Conference on Robot Learning (CoRL)*, 2019.
- *International Conference on Robotics and Automation (ICRA)*, 2017-2019.
- *International Conference on Intelligent Robots and Systems (IROS)*, 2016-2019.
- *Neural Information Processing Systems (NeurIPS) Workshop*, 2018.
- *Asian Control Conference (ASCC)*, 2017.
- *International Conference on Computer Vision System (ICVS)*, 2017.
- *International Conference on Real-time Computing and Robotics (RCAR)*, 2016.

Conference Services
- Program Committee Member of *International Conference on Computer Vision Systems (ICVS)*, Aug, 2017.
- Program Committee Member of *International Conference on Real-time Computing and Robotics (RCAR)*, June, 2016.

Conference Presentations
- IROS 2019, Macau, China
- ETRA 2019, Denver, USA
- ICRA 2019, Montreal, Canada
- ICRA 2018, Brisbane, Australia
- IROS 2017, Vancouver, Canada
- IROS 2016, Daejeon, Korea
- RCAR 2016, Angkor Wat, Cambodia

PROFESSIONAL SKILLS

Programming
- Experienced in Python, C++; Familiar with Matlab

Frameworks
- Deep Learning: PyTorch, TensorFlow
- Robotics: ROS, V-REP, Gazebo

LANGUAGE SKILLS

TOEFL-IBT
- Reading (28), Listening (28), Speaking (20), Writing (25), Total (101).   Mar. 2013

GRE
- Verbal (540), Quantitative (800), Analytical Writing (3.5).   Oct. 2010