

# Curriculum Vitae

## LEI TAI

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CONTACT INFORMATION	CYT2014 Robotics Institute, HKUST Clear Water Bay, Hong Kong	Email: <a href="mailto:ltai@ust.hk">ltai@ust.hk</a> Web: <a href="http://tailei.ram-lab.com">http://tailei.ram-lab.com</a> github: <a href="https://github.com/onlytailei">https://github.com/onlytailei</a>
EDUCATION	<b>Hong Kong University of Science and Technology</b> , Hong Kong SAR, China P.R.  Ph.D. candidate in Electronic & Computer Engineering. Sept. 2014 - present <ul style="list-style-type: none"><li>Research Interests: <i>Mobile Robotics, Deep Learning, Deep Reinforcement Learning</i></li><li>Advisor: Prof. Ming Liu</li></ul> <b>University of Freiburg</b> , Germany  Visiting Scholar in Autonomous Intelligent Systems Lab Mar. 2017 - Jan. 2018 <ul style="list-style-type: none"><li>Advisor: Prof. Dr. Wolfram Burgard</li></ul> <b>Harbin Institute of Technology</b> , Harbin, China P.R.  M.S. in Engineering. Sep. 2012 - Jun. 2014 <ul style="list-style-type: none"><li>GPA: 81.20/100 (Top 30%).</li></ul> B.S. in Engineering. Sep. 2008 - Jun. 2012 <ul style="list-style-type: none"><li>GPA: 88.17/100, (Top 10%).</li></ul>	
WORKING AND RESEARCH EXPERIENCE	<b>Research in sensorimotor learning RAM Lab</b> Aug. 2015 - present <ul style="list-style-type: none"><li>Sensorimotor learning for both indoor and outdoor robot navigation.</li><li>Improve autonomous driving through human gaze learning.</li><li>3D point cloud perception including detection and segmentation.</li></ul> <b>Research in deep RL for robotics AIS Lab</b> Mar. 2017 - Jan. 2018 <ul style="list-style-type: none"><li>Generalized deep reinforcement learning with external memory and prediction ability.</li><li>Socially compliant navigation in crowded environment.</li><li>Visual domain adaptation for learning-based visual control policies.</li></ul> <b>Algorithm R&amp;D Intern Xiangji Keji (MLOG)</b> , Beijing June. 2015 - Aug. 2015 <ul style="list-style-type: none"><li>Nowcast precipitation prediction through radar echo images with deep learning.</li><li>Optical flow estimation and motion tracking of the radar images for Tian Qi Jia.</li></ul>	
PUBLICATIONS	Journals <ol style="list-style-type: none"><li>Jingwei Zhang*, <b>Lei Tai</b>*, 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). <i>IEEE Robotics and Automation Letters (RA-L)</i>, 2019.</li><li>Peng Yun, <b>Lei Tai</b>, Yuan Wang, Ming Liu, "Focal Loss in 3D Object Detection", <i>IEEE Robotics and Automation Letters (RA-L)</i>, 2019.</li><li><b>Lei Tai</b>, Shaohua Li, Ming Liu, "Autonomous Exploration of Mobile Robots through Deep Neural Networks", <i>International Journal of Advanced Robotic Systems (IJARS)</i>, 2017.</li><li><b>Lei Tai</b>, Ming Liu, "Mobile Robots Exploration through CNN-based Reinforcement Learning", <i>Robotics and Biomimetics</i>, 2016.</li></ol>	

## Conferences

1. **Lei Tai**, Peng Yun, Yuying Chen, Congcong Liu, Haoyang Ye, Ming Liu “End-to-end Driving Deploying through Uncertainty-Aware Imitation Learning and Stochastic Visual Domain Adaptation”. *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 Learning (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 Avoidance”, *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: <a href="#">Prof. Kei May Lau</a> ECE Department, Hong Kong University of Science and Technology	
	Teaching Assistant	Fall 2018
	ELEC 1010: Electronic and Information Technology Instructor: <a href="#">Prof. George Jie Yuan</a> ECE Department, Hong Kong University of Science and Technology	
	Teaching Assistant	Spring 2015
	ELEC 3200: System Modeling, Analysis and Control Instructor: <a href="#">Prof. Ling Shi</a> ECE Department, Hong Kong University of Science and Technology	
ACADEMIC ACTIVITIES	Referee Services	
	<ul style="list-style-type: none"> <li>• <i>Autonomous Robots (AURO)</i>.</li> <li>• <i>IEEE Transactions on Neural Networks and Learning Systems (NNLS)</i>.</li> <li>• <i>IEEE Robotics and Automation Letters (RA-L)</i>.</li> <li>• <i>International Journal of Advanced Robotic Systems, (IJARS)</i>.</li> <li>• <i>International Conference on Robotics and Automation (ICRA)</i>, 2017-2019.</li> <li>• <i>International Conference on Intelligent Robots and Systems (IROS)</i>, 2016-2019.</li> <li>• <i>Neural Information Processing Systems (NeurIPS) Workshop</i>, 2018.</li> <li>• <i>Asian Control Conference (ASCC)</i>, 2017.</li> <li>• <i>International Conference on Computer Vision System (ICVS)</i>, 2017.</li> <li>• <i>International Conference on Real-time Computing and Robotics (RCAR)</i>, 2016.</li> </ul>	
	Conference Services	
	<ul style="list-style-type: none"> <li>• Program Committee Member of <i>International Conference on Computer Vision Systems (ICVS)</i>, Aug, 2017.</li> <li>• Program Committee Member of <i>International Conference on Real-time Computing and Robotics (RCAR)</i>, June, 2016.</li> </ul>	
	Conference Presentations	
	<ul style="list-style-type: none"> <li>• IROS 2019, Macau, China</li> <li>• ETRA 2019, Denver, USA</li> <li>• ICRA 2019, Montreal, Canada</li> <li>• ICRA 2018, Brisbane, Australia</li> <li>• IROS 2017, Vancouver, Canada</li> <li>• IROS 2016, Daejeon, Korea</li> <li>• RCAR 2016, Angkor Wat, Cambodia</li> </ul>	
PROFESSIONAL SKILLS	Programming	
	<ul style="list-style-type: none"> <li>• Experienced in Python, C++; Familiar with Matlab</li> </ul>	
	Frameworks	
	<ul style="list-style-type: none"> <li>• Deep Learning: PyTorch, TensorFlow</li> <li>• Robotics: ROS, V-REP, Gazebo</li> </ul>	
LANGUAGE SKILLS	TOEFL-IBT	
	<ul style="list-style-type: none"> <li>• Reading (28), Listening (28), Speaking (20), Writing (25), Total (101).</li> </ul>	Mar. 2013
	GRE	
	<ul style="list-style-type: none"> <li>• Verbal (540), Quantitative (800), Analytical Writing (3.5).</li> </ul>	Oct. 2010