ZENGYI QIN

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RESEARCH INTEREST

Robotics and Computer Vision; Medical Devices; Machine Learning; Signal Processing

EDUCATION

Massachusetts Institute of Technology 2022 - 2025
PhD in Device Realization Laboratory *Advisor: Dr. Brian Anthony*

Massachusetts Institute of Technology 2020 - 2022
S.M. in Reliable Autonomous Systems Laboratory *Advisor: Prof. Chuchu Fan*

Tsinghua University 2016 - 2020
B.E. in Electronic Engineering (with honor) *Advisor: Prof. Jiansheng Chen*

Stanford University Summer 2019
Visiting Scholar in Computer Science *Advisor: Prof. Fei-Fei Li and Prof. Silvio Savarese*

HONORS AND AWARDS

MathWorks Fellowship (2021)
Fellowship of Stanford Undergraduate Visiting and Research (UGVR) Program (2019)
Scholarship of Technological Innovation at Tsinghua University (2019 - 2020)
Scholarship of Comprehensive Excellence at Tsinghua University (2019)
The Highest Award of Challenge Cup Technological Innovation Competition at Tsinghua University (2019)
The Highest Award of Beijing Challenge Cup Technological Innovation Competition (2019)
The First Prize of Microsoft Imagine Cup Global Student Technological Competition, China Finals (2018)

PUBLICATIONS

12. **[TPAMI 21]** Zengyi Qin, Jinglu Wang, Yan Lu. "MonoGRNet: A General Framework for Monocular 3D Object Detection." *The IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2021. [PDF]
11. **[TAC 21]** Chuchu Fan, Zengyi Qin, Umang Mathur, Qiang Ning, Sayan Mitra, Mahesh Viswanathan. "Controller Synthesis for Linear System with Reach-avoid Specifications." *The IEEE Transactions on Automatic Control*, 2021. [PDF]
10. **[ICML 21]** Zengyi Qin, Yuxiao Chen, Chuchu Fan. "Density Constrained Reinforcement Learning." *The International Conference on Machine Learning*, 2021. [PDF]
9. **[ICLR 21]** Zengyi Qin, Kaiqing Zhang, Yuxiao Chen, Jingkai Chen, Chuchu Fan. "Learning Safe Multi-Agent Control with Decentralized Neural Barrier Certificates." *The International Conference on Learning Representations*, 2021. [PDF] [Website] [Code]
8. **[IROS 21]** Yue Meng, Zengyi Qin, Chuchu Fan. "Reactive and Safe Road User Simulations using Neural Barrier Certificates." *The International Conference on Intelligent Robots and Systems*, 2021.

7. **[CoRL 21]** Charles Dawson, Zengyi Qin, Sicun Gao, Chuchu Fan. "Safe Nonlinear Control Using Robust Neural Lyapunov-Barrier Functions." *The Conference on Robot Learning*, 2021. [PDF]
6. **[SR 21]** Zengyi Qin, Jiansheng Chen, Zhenyu Jiang, Xumin Yu, Chunhua Hu, Yu Ma, Suhua Miao, Rongsong Zhou. "Learning Fine-Grained Estimation of Physiological States from Coarse-Grained Labels by Distribution Restoration." *Scientific Reports*, 2021. [PDF]
5. **[ACM MM 20]** Zengyi Qin, Jinglu Wang, Yan Lu. "Weakly Supervised 3D Object Detection from Point Clouds." *ACM Multimedia*, 2020. [PDF] [Code]
4. **[ICRA 20]** Zengyi Qin, Kuan Fang, Yuke Zhu, Li Fei-Fei, Silvio Savarese. "KETO: Learning Keypoint Representations for Tool Manipulation." *The International Conference on Robotics and Automation*, 2020. [PDF] [Website] [Video]
3. **[AAAI 19]** Zengyi Qin, Jinglu Wang, Yan Lu. "MonoGRNet: A Geometric Reasoning Network for Monocular 3D Object Localization." *The Thirty-Third AAAI Conference on Artificial Intelligence*, 2019. **Oral Presentation** ($< 8\%$) [PDF] [Website] [Code]
2. **[CVPR 19]** Zengyi Qin, Jinglu Wang, Yan Lu. "Triangulation Learning Network: from Monocular to Stereo 3D Object Detection." *The International Conference on Computer Vision and Pattern Recognition*, 2019. [PDF] [Website] [Code]
1. **[SPL 19]** Zengyi Qin*, Zhenyu Jiang*, Jiansheng Chen, Chunhua Hu, Yu Ma. "sEMG based Tremor Severity Evaluation for Parkinson's Disease using a Light-weight CNN." *IEEE Signal Processing Letters*, 2019. [PDF] [Website]

RESEARCH EXPERIENCES

Reliable Autonomous Systems Lab at MIT Sep. 2020 - Jan 2022
Graduate Student Researcher *Advisor: Prof. Chuchu Fan*

- Project: Advancing the safety of autonomous systems via certifiable algorithms

Stanford Vision and Learning Lab July 2019 - Sep. 2019
Visiting Scholar *Advisor: Prof. Fei-Fei Li and Prof. Silvio Savarese*

- Project: Robotic dexterous manipulation via self-supervised keypoint representations

Microsoft Research Asia, Media Computing Group June 2018 - July 2019
Research Intern *Advisor: Dr. Jinglu Wang*

- Project: 3D scene understanding for autonomous driving

Tsinghua University, High-speed Image Processing Lab Sep. 2017 - June 2018
Undergraduate Student Researcher *Advisor: Prof. Jiansheng Chen*

- Project: Early diagnosis of Parkinson's Disease via surface electromyography

PATENTS

1. "Surface Electromyography-based Parkinson's Disease Diagnosis", CN210697629U, granted July 2020.

INVITED TALKS

2. "Learning Keypoint Representations for Tool Manipulation", *Stanford University*, Stanford, CA, 2019.
1. "A Geometric Reasoning Network for Monocular 3D Object Localization", *The AAAI Conference on Artificial Intelligence*, Honolulu, Hawaii, 2019.

LEADERSHIP AND ACTIVITIES

- Member of the execution team of MIT Chinese Entrepreneurs Organization
- Co-founder and Chief of Student Association of Data Science and Machine Learning at Tsinghua University