# QI YAN

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## EDUCATION

**Swiss Federal Institute of Technology, Lausanne (EPFL)** Sep. 2019 - Present
*MSc in Mechanical Engineering*, focusing on perception, planning and control for robotics
Core courses: *Artificial Neural Network* *Deep Learning for Autonomous Vehicles*
*Computer Vision* *Image Analysis and Pattern Recognition*
*Model Predictive Control* *System Identification*

**Shanghai Jiao Tong University (SJTU), China** Sep. 2015 - June 2019
*B.E. in Nuclear Engineering,* School of Mechanical Engineering (Honors), GPA: **3.76/4.0**

## PUBLICATIONS

Y. Liu, **Q. Yan**, A. Alahi. "Social NCE: Contrastive Learning for Socially-aware Trajectory Forecasting and Motion Planning", to appear at *NeurIPS 2020 Workshop on Self-Supervised Learning*, December 2020.

**Q. Yan**, R. Li, and X. Meng. "Tribo-Dynamic Simulation and Motion Control of a Rotating Manipulator Based on the Load and Temperature Dependent Friction", *Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology*, September 2020.

**Q. Yan**, L. Jiang and S. S. Kia, "Measurement Scheduling for Cooperative Localization in Resource-Constrained Conditions," in *IEEE Robotics and Automation Letters*, vol. 5, no. 2, April 2020. (also selected by ICRA'20 Committee for conference presentation)

## EXPERIENCES

**Contrastive Learning for Socially-aware Robot Navigation**
Master student, EPFL, Switzerland July. 2020 - Present
Advisor: *Prof. Alexandre Alahi*, Lab of Visual Intelligence for Transportation, EPFL

· Employed contrastive learning to learn socially-aware representations for DRL-based navigation policy. Utilized prior knowledge on socially unfavorable events to synthesize negative samples, which significantly boosts RL sample efficiency and offline RL performance.

**Visual Absolute Localization in *a priori* Known Environment**
Master student, EPFL, Switzerland Feb. 2020 - Present
Advisor: *Dr. Iordan Doytchinov*, Laboratory of Geodetic Engineering, EPFL

· Developed an improved structure-based visual localization method in PyTorch. Achieved ∼10 m & 5 deg accuracy in a large synthetic dataset, close to state-of-the-art results. Next step to explore transfer learning technique to make it easier to deploy in different scenes.

**Droplet Size Estimation Using Deep Learning Method**
Undergraduate thesis, Shanghai Jiao Tong University, China Mar. 2019 - June 2019
Advisor: *Prof. Xiang Chai*, School of Mechanical Engineering, Shanghai Jiao Tong University

· Employed a learning algorithm for semantic segmentation on droplet images. Attained the size estimation with ∼10% uncertainty, comparable to manual segmentation results.

**Cost-effective Cooperative Localization Algorithm Design**
Research student, UC Irvine, USA Jul. 2018 - Sep. 2019
Advisor: *Prof. Solmaz S. Kia*, Dept. of Mechanical and Aerospace Engineering, UC Irvine

· Proposed a sub-optimal algorithm for the NP-hard multi-robot measurement selection problem. Compared with the state-of-the-art method with similar performance, it holds no assumption on observability and works much faster. Paper accepted by RA-L.

**Friction Dynamics Analysis and Control of Manipulator**
Research student, Shanghai Jiao Tong University, China Dec. 2017 - Dec. 2018
Advisor: *Prof. Xianghui Meng*, School of Mechanical Engineering, Shanghai Jiao Tong University

· Carried out tribo-dynamic modeling of a manipulator joint considering motor load and temperature. Developed a terminal sliding mode controller, which doesn't need prior disturbance information for stability. Paper accepted by *Journal of Engineering Tribology.*

## SKILLS

**Perception**: digital image processing, visual camera re-localization, object detection and tracking, cooperative localization, extended Kalman filter

**Planning**: reinforcement learning, deep Q-learning, actor-critic policy optimization, model predictive control

**Actuation**: robotic kinematic and dynamic analysis, system identification

**Software**: proficient: Python, PyTorch, MATLAB; intermediate: C++, Java, Solidworks

**Languages**: Chinese: native; English: C1

## OTHERS

**Reviewer**: IEEE Sensors Letters, 2020