

## Tong Qin

### Contact Information

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### Education & Work

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- 04/2019-07/2019 **Facebook Reality Labs (Oculus Research)**, Seattle, US  
Research Intern  
Mentor: Anastasios Mourikis
- 09/2015-09/2019 **Hong Kong University of Science and Technology**, Hong Kong  
(expected) PhD at Aerial Robotics Group, Robotics Institute, Dept. ECE  
Adviser: Shaojie Shen  
Research Interests: visual SLAM, sensor fusion, visual-inertial system, autonomous driving, VR/AR  
Citations: 200+
- 09/2011-08/2015 **Zhejiang University**, Hangzhou, China  
Bachelor at Dept. Control Science and Engineering  
GPA: 3.93/4.0 (88.8/100)  
Ranking: 4/132

### Research

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#### Visual-inertial systems (VINS)

By assisting cameras with Inertial Measurement Unit (IMU), visual-inertial systems achieve high-accurate 6-DoF state estimations, which are of great importance for autonomous applications. I specifically design algorithm for robust initialization, temporal and spatial calibration, map reuse.

#### Multiple sensor fusion

Fusing global sensors (GPS, Magnetometer, barometer...) with local sensors (IMU, camera, Lidar, wheel odometry...), multi-sensor fusion can achieve robust and accurate pose estimation in various environment.

#### Lidar-based localization and mapping

Laser Odometry and Mapping is a realtime method for state estimation and mapping using 3D point cloud from Velodyne. This algorithm is applied to autonomous navigation on ground vehicles.

#### Autonomous flight on unmanned aerial vehicle (UAV)

Equipping the UAV with various intelligent algorithm, it can achieve

self-localization, environmental perception, obstacle avoidance and autonomous flight in complicated environment.

## Honors

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2018	TRO 2018 <b>Best Paper Honorable Mention</b>
2018	IROS 2018 <b>Best Student Paper Award</b>
2015	The first prize in International Aerial Robotics Competition
2014	National Scholarship of China (Top 2%)
2014	First-Class Scholarship for Outstanding Student, Zhejiang University (Top 3%)
2014	The second prize in Robot contest, Zhejiang University
2013 2012	Excellent Students Awards, Zhejiang University
2012	The first prize in Physical Innovation Contest, Zhejiang province

## Teaching Experience

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Teaching Assistant at Dept. ECE, HKUST  
ELEC 1100: Introduction to Electro-Robot Design  
ELEC 5660: Introduction to Aerial Robotics

## Public Library

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VINS-Mono: <https://github.com/HKUST-Aerial-Robotics/VINS-Mono> (1400 Star)  
VINS-Mobile: <https://github.com/HKUST-Aerial-Robotics/VINS-Mobile> (800 Star)  
VINS-Fusion: <https://github.com/HKUST-Aerial-Robotics/VINS-Fusion> (400 Star)

## Journal Publications

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- [1] **Tong Qin**, Peiliang Li, and Shaojie Shen. "VINS-MONO: A Robust and Versatile Monocular Visual-Inertial State Estimator." IEEE Transactions on Robotics (TRO), 2018 (**Best Paper Honorable Mention**)
- [2] Yi Lin, Fei Gao, **Tong Qin**, Wenliang Gao, Tianbo Liu, William Wu, Zhenfei Yang, and Shaojie Shen. "Autonomous Aerial Navigation Using Monocular Visual-Inertial Fusion." Journal of Field Robotics (JFR), 2017
- [3] Kejie Qiu, **Tong Qin**, Wenliang Gao and Shaojie Shen, "Tracking 3D Motion of Dynamic Objects Using Monocular Visual-Inertial Sensing," IEEE Transactions on Robotics (TRO), 2018

## Conference Publications

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- [1] **Tong Qin** and Shaojie Shen. "Online Temporal Calibration for Monocular Visual-Inertial Systems." IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018 (**Best Student Paper**)
- [2] **Tong Qin**, Peiliang Li, and Shaojie Shen. "Relocalization, Global Optimization and Map Merging for Monocular Visual-Inertial SLAM." IEEE International Conference on Robotics and automation (ICRA), 2018

[3] **Tong Qin** and Shaojie Shen. “Robust Initialization of Monocular Visual-inertial Estimation on Aerial Robots.” IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2017

[4] Peiliang Li, **Tong Qin**, and Shaojie Shen, “Stereo Vision-based Semantic 3D Object and Ego-motion Tracking for Autonomous Driving”, European Conference on Computer Vision (ECCV), 2018

[5] Kejie Qiu, **Tong Qin**, Hongwen Xie, and Shaojie Shen, “Estimating Metric Poses of Dynamic Objects Using Monocular Visual-Inertial Fusion.” IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018

[6] Peiliang Li, **Tong Qin**, Botao Hu, Fengyuan Zhu, and Shaojie Shen, “Monocular Visual-Inertial State Estimation for Mobile Augmented Reality.” IEEE International Symposium on Mixed and Augmented Reality (ISMAR), 2017

[7] Haofei Wang, Jimin Pi, **Tong Qin**, Shaojie Shen, and, Bertram E Shi, “SLAM-based Localization of 3D Gaze Using a Mobile Eye Tracker”, ACM Symposium on Eye Tracking Research & Applications (ETRA), 2018