Tixiao Shan

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━━━ EDUCATION

2014–Present	**Stevens Institute of Technology**, *Ph.D.*, Mechanical Engineering.
	Thesis: A Lightweight, Online Autonomous Navigation System for Unmanned Ground Vehicles
2011–2014	**Shanghai University**, *M.S.*, Mechanical Electronics Engineering.
	Thesis: Research and Design of Data Fusion of A Navigation System and Path Planning Method for Unmanned Aerial Vehicles
2007-2011	**Qingdao University**, *B.S.*, Mechanical and Electrical Engineering.
	Thesis: Dedicated Flange Manufacturing System Design

━━━ RESEARCH EXPERIENCE

2014 - Present **Research Assistant**, *Stevens Institute of Technology*.
- Developing a lightweight lidar odometry for ego-estimation running on embedded systems.
- Developing a traversability mapping algorithm for UGVs equipped with a sparse lidar.
- Developing a lidar super-resolution method for a sparse lidar using deep learning.
- Developing multi-objective path planning algorithms for autonomous navigation in cluttered environment using Turtlebot and Clearpath Jackal.
- Contributing to the motion planning software for underwater pipe inspection using BlueROV2.

2013 - 2014 **Assistant Engineer Intern**, *Shanghai ABB Engineering CO. Ltd.*.
- Contributed to the design of a production line for BMW engine assembly.
- Designed automatic assembly tool for BMW clutch manufacture.

2012 - 2014 **Research Assistant**, *Shanghai University*.
- Designed embedded control system circuit board for UAV, a project sponsored by National Natural Science Foundation of China (No.61175092).
- Implemented sensor fusion algorithm for UAV pose estimation using Kalman filter.

━━━ TEACHING EXPERIENCE

2017-Present	**Intro to Robotics**, *Lab Instructor*, Stevens Institute of Technology.
2017-Present	**Control Systems**, *Teaching Assistant*, Stevens Institute of Technology.
2018	**Engineering Design**, *Instructor*, Stevens Institute of Technology.
2016	**Systems Laboratory**, *Instructor*, Stevens Institute of Technology.
2012	**CAD and CAM**, *Lecturer*, Shanghai University.

━━━ SKILLS

Expertise	SLAM, Autonomous Navigation, Deep Learning, 3D Modeling
Programming	C/C++, Python
Software Infrastructure	ROS, PCL, OpenCV, Tensorflow, PyTorch, Keras, Numpy, Matplotlib, Matlab, AutoCAD, Solidworks, Gazebo, Linux, Final Cut Pro X

PUBLICATIONS

2019   K. Doherty, T. Shan, J. Wang, and B. Englot, "Learning-aided 3D Occupancy Mapping with Bayesian Generalized Kernel Inference," *IEEE Transactions on Robotics*, Accepted, To Appear.

2019   J. Wang, T. Shan, and B. Englot, "Underwater Terrain Reconstruction from Forward-Looking Sonar Imagery," *IEEE International Conference on Robotics and Automation*, Accepted, To Appear in May 2019.

2019   F. Chen, S. Bai, T. Shan and B. Englot. "Self-Learning Exploration and Mapping for Mobile Robots via Deep Reinforcement Learning." *International AIAA Information-Driven Decision and Control Conference*, 2019

2018   T. Shan, K. Doherty, J. Wang and B. Englot. "Bayesian Generalized Kernel Inference for Terrain Traversability Mapping." *Conference on Robot Learning*, 2018.

2018   T. Shan and B. Englot. "LeGO-LOAM: Lightweight and Ground-Optimized Lidar Odometry and Mapping on Variable Terrain." *IEEE/RSJ International Conference on Intelligent Robots and Systems*, pp. 4758-4765, 2018.

2017   T. Shan and B. Englot. "Belief roadmap search: Advances in optimal and efficient planning under uncertainty." *IEEE/RSJ International Conference on Intelligent Robots and Systems*, pp. 5318-5325, 2017.

2016   B. Englot, T. Shan, S.D. Bopardikar, and A. Speranzon. "Sampling-based min-max uncertainty path planning." *IEEE International Conference on Decision and Control*, pp. 6863-6870, 2016.

2015   T. Shan and B. Englot. "Sampling-based Minimum Risk path planning in multiobjective configuration spaces." *IEEE International Conference on Decision and Control*, pp. 814-821, 2015.

OTHER PUBLICATIONS

2019   T. Shan, J. Wang, and B. Englot, "Simulation-based Lidar Super-resolution for Ground Vehicles," *IEEE/RSJ International Conference on Intelligent Robots and Systems*, under review.

2019   J. Wang, T. Shan, and B. Englot, "Virtual Maps for Autonomous Exploration with Pose SLAM," *IEEE/RSJ International Conference on Intelligent Robots and Systems*, under review.

2019   J. Wang, T. Shan, T. Osedach, and B. Englot, "Deep Learning for Detection and Tracking of Underwater Pipelines using Multibeam Imaging Sonar," *IEEE International Conference on Robotics and Automation Workshop*, under review.

2015   T. Shan and B. Englot, "Tunable-Risk Sampling-Based Path Planning Using a Cost Hierarchy," *IEEE International Conference on Robotics and Automation Workshop*, pp. 2, 2015.

PROFESSIONAL ACTIVITIES

- Member of IEEE
- Reviewer for the Following Technical Conferences and Publications:

- International Conference on Robotics and Automation (ICRA)
- International Conference on Intelligent Robots and Systems (IROS)
- Workshop on the Algorithmic Foundations of Robotics (WAFR)
- IEEE Robotics and Automation Letters (RA-L)
- IEEE Control Systems Letters (L-CSS)

━━━━ AWARDS

2014-2017	Stevens Innovation and Entrepreneurship Fellowship
2013	China National Scholarship for Graduate Students
2013	Shanghai University Outstanding Students
2007-2010	Qingdao University Scholarship
2008-2010	Qingdao University Outstanding Students
2009	Tsingtao Brewery Education Scholarship

━━━━ REFERENCES

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Department of Mechanical Engineering
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