

LEI FAN

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EDUCATION

Northwestern University,
Ph.D. in Electrical and Computer Engineering.
(Advisor: Professor Ying Wu)

Evanston, IL
September, 2019 - Present

Sun Yat-sen University,
M.S. in Engineering.
(Advisor: Professor Long Chen)

Guangzhou, China
September, 2017 - June, 2019

Sun Yat-sen University,
B.E. in Software Engineering.

Guangzhou, China
September, 2013 - June, 2017

RESEARCH INTERESTS

Robotic Perception; 3D Scene Understanding

PUBLICATIONS

Lei Fan, Peixi Xiong, Wei Wei, Ying Wu, "**FLAR: A Unified Prototype Framework for Few-sample Lifelong Active Recognition**", accepted by the IEEE International Conference on Computer Vision, 2021.

Xuehui Wang, Qingyun Zhao, **Lei Fan**, Yuzhi Zhao, Tiantian Wang, Qiong Yan, Long Chen, "**SemaSuperpixel: A Multi-channel Probability-driven Superpixel Segmentation Method**", accepted by the IEEE International Conference on Image Processing, 2021.

Xuehui Wang, Qing Wang, Yuzhi Zhao, Junchi Yan, **Lei Fan**, and Long Chen, "**Lightweight Single-Image Super-Resolution Network with Attentive Auxiliary Feature Learning**", accepted by Asian Conference on Computer Vision, 2020.

Jiasong Zhu, **Lei Fan**, Wei Tian, Long Chen, Dongpu Cao, and Fei-Yue Wang, "**Toward the Ghosting Phenomenon in a Stereo-Based Map With a Collaborative RGB-D Repair**", accepted by IEEE Transactions on Intelligent Transportation Systems, 2020.

Yucai Bai, **Lei Fan**, Ziyu Pan, and Long Chen, "**Monocular Outdoor Semantic Mapping with a Multi-task Network**", accepted by IEEE/RSJ International Conference on Intelligent Robots and Systems 2019.

Lei Fan, Long Chen, Chaoqiang Zhang, Wei Tian, and Dongpu Cao, "**Collaborative 3D Completion of Color and Depth in a Specified Area with Superpixels**", accepted by IEEE Transactions on Industrial Electronics, 2018.

Lei Fan, Long Chen, Kai Huang and Dongpu Cao, "**Planecell: Representing Structural Space with Plane Elements**", accepted as **Best Student Paper** by IEEE Intelligent Vehicles Symposium, 2018.

Long Chen, **Lei Fan**, Jianda Chen, Dongpu Cao, and Feiyue Wang, "**A Full Density Stereo Matching System Based on the Combination of CNNs and Slanted-planes**", accepted by IEEE

Transactions on Systems, Man, and Cybernetics: Systems, 2017.

Long Chen, Yuhang He, and **Lei Fan**, "**Let the Robot Tell: Describe Car Image with Natural Language via LSTM**", accepted by Pattern Recognition Letters, 2017.

Long Chen, **Lei Fan**, Guodong Xie, Kai Huang, and Andreas Nuchter, "**Moving-Object Detection from Consecutive Stereo Pairs using Slanted Plane Smoothing**", accepted by IEEE Transactions on Intelligent Transportation Systems, 2017.

Long Chen, Libo Sun, Teng Yang, **Lei Fan**, Kai Huang, and Zhe Xuanyuan, "**RGB-T SLAM: A Flexible SLAM Framework by Combining Appearance and Thermal Information**", accepted by IEEE International Conference on Robotics and Automation, 2017.

EXPERIENCES

DJI, Inc	Summer 2016
<i>Visual Engineer Intern</i>	<i>Shenzhen, China</i>

Developing 3D reconstruction and obstacle avoidance algorithms for unmanned aerial vehicle based on the stereo camera.

Calibrating and rectifying the stereo fish-eye camera.

Developing stereo matching algorithms for fish-eye cameras which could give a wider range map.

CURRENT RESEARCHES

Active Recognition under Challenges	September 2019 - Now
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Efficient recognition policy learning under the few-sample challenge.

Addressing open-world/life-long active recognition difficulties, including but not limited to catastrophic forgetting, novelty detection and policy learning.

Controllable Image Generation for Articulated Objects	June 2021 - Now
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For a better attribute disentanglement, a 3D-aware GAN model for articulated objects, including the human body and other animals, is preferred compared to methods operating in the 2D domain.

During the content creation, the target articulated pose and other underlying variants should be controllable.

Only 2D images should be provided to prevent the high expense of collecting 3D data.

TECHNICAL STRENGTHS

Computer Languages/Libraries/Frameworks	C++, Python, PyTorch, Matlab, OpenCV, ROS
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