FAN, LEI

No. 132, Waihuan East Road ⋄ Guangzhou, P.R. China

Phone: (086) · 137-5003-7830 ⋄ Mail: fanl7@mail2.sysu.edu.cn ⋄ Birth: 10/28/1995

EDUCATION

Sun Yat-sen University   9/2017-6/2019
Institute of Unmanned Systems, School of Data and Computer Science
Master of Engineering, expected in 6/2019
Supervised under Prof. Long Chen
Overall Ranking: 1/390

Sun Yat-sen University   9/2013-6/2017
School of Data and Computer Science
Major in Software Engineering
Bachelor of Engineering, received in 6/2017
Overall GPA: 3.8/4.0

RESEARCH INTEREST

Stereo vision; 3D reconstruction; Semantic segmentation; Autonomous driving

PUBLICATION

Chen L, Sun L, Yang T, **Fan L**, et al. **RGB-T SLAM: A Flexible SLAM Framework by Combining Appearance and Thermal Information**[C]. Robotics and Automation (ICRA), 2017 IEEE International Conference on. IEEE, 2017: 5682-5687.

Chen L, **Fan L**, Xie G, et al. **Moving-Object Detection from Consecutive Stereo Pairs Using Slanted Plane Smoothing**[J]. IEEE Transactions on Intelligent Transportation Systems, 2017, 18(11): 3093-3102.

Chen L, He Y, **Fan L. Let the Robot Tell: Describe Car Image with Natural Language via LSTM**[J]. Pattern Recognition Letters, 2017, 98: 75-82.

Chen L, **Fan L**, Chen J, et al. **A Full Density Stereo Matching System Based on the Combination of CNNs and Slanted-Planes**[J]. IEEE Transactions on Systems, Man, and Cybernetics: Systems, 2017.

Fan L, Chen L, Huang K, et al. **Planecell: Representing Structural Space with Plane Elements**[C]. 2018 IEEE Intelligent Vehicles Symposium (IV). IEEE, 2018: 978-985. (**Best Student Paper**)

Fan L, Chen L, Zhang C, et al. **Collaborative 3D Completion of Color and Depth in a Specified Area with Superpixels**[J]. IEEE Transactions on Industrial Electronics, 2018.

EXPERIENCE

3D Semantic Reconstruction from a Monocular Camera with a Novel Multi-task Network
May 2018 - Now

· We explore the interplay between low-level features for both depth and semantic prediction.
· The proposed network can produce the depth and semantic maps simultaneously, which provides basic knowledge for further semantic map reconstruction.

- We apply image segmentation techniques to refine the depth prediction to reduce the fluctuations caused by convolution layers.
- The final map is saved in a memory-friendly way to present a large-scale urban scene.
- The corresponding paper is recently submitted to the IEEE ICRA 2019. A video demo is uploaded to YouTube (`https://youtu.be/iSrZSrdn8zks`) for demonstrating the result of our algorithm.

Using 3D Map Completion Method to Solve Ghosting Phenomenon October 2017 - September 2018

- The proposed method solves ghosting phenomenon caused by moving objects in a stereo-based 3D map.
- The color and depth completion approach fills large area loss employing the planarity knowledge to propagate the structure.
- The corresponding paper is accepted by IEEE Transactions on Industrial Electronics.

Planecell 3D Map Representation Method Developing January 2017 - September 2017

- The plancell extracts planarity from the depth-assisted image segmentation and then directly projects these depth planes into the 3D world.
- The method demonstrates its advancement especially in dealing with the large-scale structural environment, such as autonomous driving scene.
- Intending to obtain instance-level segmentation result from semantic segmentation.
- A video demo can be found at `https://www.youtube.com/watch?v=acingwUyB4Q&t=23s`.

Visual Engineer Intern, DJI, Inc Summer 2016

- Developing 3D reconstruction and obstacle avoidance algorithms for unmanned aerial vehicle based on the stereo camera.
- Calibrating and rectificating the stereo fish-eye camera.
- Developing stereo matching algorithms for fish-eye cameras which could give a wider range map.

Moving-object Detection Algorithm Developing March 2016 - January 2017

- The proposed method abandons the process of dense optical/scene flow calculation while giving pixel-level moving-object detection results. By accelerating on the GPU, it can run at 20 frames per second.
- A video demo is uploaded to `https://youtu.be/DUGcoNMuOS8` for demonstrating the result of our algorithm.

CNN-SPS Algorithm Developing September 2015

- Participated in the programming and paper writing.
- The proposed method is applied the semi-global matching and the slanted-plane model on the similarities from the CNN to produce accurate dense disparity maps.
- The proposed method achieves the third place on the KITTI stereo 2015 benchmark in 2015.

HONOR

Third Prize Merit-based Scholarship, SYSU 9/2014
Second Prize Merit-based Scholarship, SYSU 9/2015
Best Student Paper, IEEE Intelligent Vehicle Symposium 2018
First Prize Merit-based Grant, SYSU 9/2017
First Prize Merit-based Grant, SYSU 9/2018
National Merit Scholarship, SYSU, 9/2018

TECHNICAL STRENGTHS

Computer Languages/Libraries/Frameworks C++, OpenCV, Python, Matlab, Tensorflow