Muchen Sun

CONTACT INFORMATION

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EDUCATION

Northwestern University — EVANSTON, USA
M.S. in Mechanical Engineering — *2019.9 – Present*

Lanzhou University — GANSU, CHINA
B.E. in Computer Science and Technology — *2015.9 – 2019.6*

RESEARCH EXPERIENCES

Bachelor's Thesis: Analysis of Applying Adaptive Thresholding Method in LiDAR-Based Road Edge Detection Task *(Excellent Bachelor's Thesis)*
Lanzhou University, China *2019.1 - 2019.6*
Advisor: Prof. Qingguo Zhou, Dept of Computer Science and Technology

- Built a simulation model using V-REP to establish an assumption for distribution of the data generated by a LiDAR-based road edge detection algorithm.
- Exploited Rosin thresholding method to both simulated data and real world data to analyze the application of adaptive thresholding method in LiDAR-based road edge detection task.

Autonomous Driving Research Group
Lanzhou University, China *2018.10 – 2019.6*
Advisor: Prof. Qingguo Zhou, Dept of Computer Science and Technology

- Implemented a LiDAR-based road segmentation method with Point Cloud Library(PCL) in ROS[1].
- Implemented a LiDAR-based mapping framework with normal distribution transforms(NDT) and sliding window strategy for road marking extraction with Point Cloud Library(PCL) in ROS.

StuPyd: Language For Programming Education
Website: `https://github.com/StuPyd/stupyd-lang`
Lanzhou University, China *2018.5 – 2018.11*
Advisor: Prof. Hao Yan, Dept of Computer Science and Technology

- Designed and implemented part of the compiler parser with Python and Another Tool for Language Recognition(ANTLR).
- Designed and implemented the back end of the compiler as a bytecode execution virtual machine.
- Implemented a Jupyter Notebook kernel based on the compiler.

PUBLICATION

[1] Zebang Shen, Yichong Xu, Muchen Sun, Alexander Carballo, Qingguo Zhou. 3D Map Optimization with Fully Convolutional Neural Network and Dynamic Local NDT. *IEEE International Conference on Intelligent Transportation Systems(ITSC)*, Auckland, NZ, October 2019. In Press.

SOFTWARE

ROS-Lab: Docker-Based Robot Operating System Virtual Lab
Website: `https://github.com/MuchenSun/ros-lab`

- Built a docker image to enable users to access Ubuntu desktop environment with Robot Operating System(ROS) in the web browser.
- Implemented a REPL user interface to simplify Docker operations.

Robot Operating System Driver for the DeepCam Face Recognition API

- Implemented a Robot Operating System(ROS) driver for the face recognition API of the DeepCam company.
- Implemented a face scanner demonstration with this driver on the TurtleBot3 robot.

Extended Professional Experience

University of California San Diego — San Diego, USA
University and Professional Studies Program — *2017.9 – 2017.12*
Visiting Student

Honors and Awards

2016 – 2017 Second-class Scholarship of Lanzhou University
2015 – 2016 Second-class Scholarship of Lanzhou University

Technical Skills

Computer Languages: Python, C++, MATLAB
Frameworks and Libraries: ROS, PCL, OpenCV, Keras
Tools: Make, Git, Docker, ANTLR, LaTeX

Related Coursework

- ❑ Data Structure
- ❑ C++ Programming
- ❑ Principle of Compiling
- ❑ Numerical Analysis
- ❑ The Design and Analysis of Algorithm
- ❑ Operating Systems
- ❑ Digital Logic
- ❑ Linux Embedded Development