Guangyuan (Gideon) Weng

393 Mid Huaxia Rd., Shanghai, China 201210

https://robotics.shanghaitech.edu.cn/people/wenggy

cnzxwgy@gmail.com (+86) 173 173 23263

EDUCATION

ShanghaiTech University **Shanghai, China**

Computer Science *Sept. 2017 - Present*

School of Information Science and Technology

- Elected a graduate level **Cryptography** course, got **A**.

RESEARCH

Graph-based Method for Solving Least-squares Problems *Nov. 2019 - Present*

- **Advisor**: Prof. Sören Schwertfeger, The Mobile Autonomous Robotic Systems Lab (MARS Lab).
- Minimize least-squares error by using graph-based optimization method;
- Utilized *g2o*, which is a general framework for graph optimization, the method has great application prospects on camera calibration.

Advanced Mapping Robot II *Sept. 2019 - Present*

- **Advisor**: Prof. Sören Schwertfeger, MARS Lab.
- A upgraded version of the Mapping Robot based on **Husky Robot** with more advanced setting and higher-precise sensors, including 60Hz Video capture, Stereo Infrared and Event cameras, Omni cameras, 2x 128 beam Lidars, and dGPS;
- Responsible for hardware synchronization of all sensors, wireless synchronization with the tracking system, design and implementation of a 17-sensor ultrasound ring.

Advanced Mapping Robot *Sept. 2018 - Apr. 2019*

- **Advisor**: Prof. Sören Schwertfeger, MARS Lab.
- Built a mapping robot with super-precise timing and localization with hardware synchronization;
- Implemented a *frame drop detection algorithm* for cameras using C++ and the Robot Operating System (ROS);
- Designed printed circuit board **(PCB)** mounted on the **Jackal Robot** to produce synchronized signal needed for all sensors (e.g., a inertial measurement unit and two Velodynes) and reduce noise of trigger signal;
- Three datasets are generated to evaluate the performance of mapping algorithms within a room and between rooms.

PUBLICATION

Advanced Mapping Robot and High-Resolution Dataset

- Chen, H., Z. Yang, X. Zhao, **G. Weng**, H. Wan, J. Luo, X. Ye, Z. Zhao, Z. He, T. Dong, S. Schwertfeger.
- Journal of ***Robotics and Autonomous Systems***. (Under review)

Towards Generation and Evaluation of Comprehensive Mapping Robot Datasets

- Chen, H., X. Zhao, J. Luo, Z. Yang, Z. Zhao, H. Wan, X. Ye, **G. Weng**, Z. He, T. Dong, S. Schwertfeger.
- Workshop on Dataset Generation and Benchmarking of SLAM Algorithms for Robotics and VR/AR of the *2019 IEEE International Conference on Robotics and Automation* **(ICRA)**.

TECHNICAL STRENGTHS

Languages	Chinese, English (frequent user)
Computer Languages	Python, C++, C, RISC-V, MATLAB, PyQt
Protocols & APIs	Processing, ROS, Numpy, LaTeX

PROJECTS

Music Composition by Using Markov-Like Models *Dec. 2019 - Jan. 2020*

- Proposed two kinds of *Markov-Like Models* based on music theory i.e., first-order and second-order models;
- Trained multiple levels of *Markov-Like Models* on piano pieces from the modern era and consider the models' ability to generate new pieces.

MCMC Based Inference for Galerkin System of Poisson's Equation *Nov. 2019 - Jan. 2020*

- Solved one kind of Bayesian inverse problem in physical situation by *Markov Chain Monte Carlo*;
- Utilized *Galerkin Approximation*, a well studied technique of *Finite Element Method*, to reduce the computational cost of Bayesian inverse problems, without sacrificing much accuracy.

Pintos Operating System *Sept. 2019 - Jan. 2020*

- Pintos was developed for Stanford's CS 140 operating system (OS) course as a successor to *Nachos*;
- Developed four modules of an OS based on the original framework, more than **3500** lines of code;
- Designed four interactive modules regard to the principles of multi-programming, scheduling, virtual memory, and filesystems, got **A** grade.

GCourse *May 2019 - Present*

- Built front end for a course evaluation platform of *ShanghaiTech University*;
- Utilized *Django*, *Bootstrap*, will serve the ShanghaiTech community after the website is online.

Dou Dizhu *Apr. 2019 - June 2019*

- A poker game, the final project of *Software Engineering* course, got **A** grade;
- Independently developed the complete back end and front end of the poker game app by MATLAB;
- Designed three interactive systems within one week, more than **2000** lines of code.

Trilogy of Life *July 2018*

- **Advisor**: Jayson Haebich, Cambridge School of Art.
- *Projection Mapping and Creative Coding with Processing* (*Java*) course project, finished the project within 24 hours, got **A** grade;
- The background music was selected from album *Vienna Premiere* by Marilyn Hill Smith and Johann Strauss Orchestra.

Nurse Turtlebot *June 2018*

- A robot using gesture and speech recognition to deliver items to patients;
- Utilized simultaneous localization and mapping (*SLAM*) in a complicated area and used Leap motion to capture and recognize gestures;
- Finished the project within 24 hours in *The Hack 2018* (Hackathon).

TEACHING EXPERIENCE

Upenn Curiosity AI Robotics and Smart Material Summer Camp **Shanghai, China**

Teaching Assitant *Aug. 2019*

- Supervised by Prof. Jianbo Shi, *GRASP Lab* of *University of Pennsylvania*.

EXPERIENCE

Social Practice **Wase Town, Yunan, China**

Vice Leader *July 2018 - Aug. 2018*

- Made a systematic report on the Bai architecture and contributed to *Baidu Encyclopedia* and *Wikipedia*.

2018 Summer School on Fog Computing **Shanghai, China**

IEEE ComSoc, OpenFog Consortium *June 2018*