Zida Wu

https://milkytipo.github.io/

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EDUCATION AND WORK EXPERIENCE

Shanghai Jiao Tong University   *September 2017 - Present*
Master of Electronics and Communication Engineering
Department of Electronic and Electrical Engineering

Agency for Science, Technology and Research of Singapore   *July 2019 - September 2019*
Summer Intern in Mechatronics Lab, SIMTech,

Xidian University   *September 2013 - July 2017*
Bachelor of Telecommunication Engineering
Department of Telecommunication Engineering

AWARDS

Outstanding Graduates of Shanghai Jiao Tong University	*December 2019*
Third prize of the 15th China Graduate Mathematical Modelling Contest	*December 2018*
Chinese National Graduate Scholarship (top 3%)	*November 2018*
Merit Student Prize of Shanghai Jiao Tong University (top 5%)	*October 2018*
First Prize Scholarship of Shanghai Jipao Tong University (top 20%)	*September 2017*
Outstanding Graduates of Xidian University (top 5%)	*July 2017*
Pacesetter of Outstanding Volunteer (top 1‰)	*September 2016*
Second Prize Scholarship of Xidian University	*September 2015*
First Prize Scholarship of Xidian University	*September 2014*

PUBLICATIONS

Z. Wu, P. Liu, Q. Liu, et al. "Pseudorange Double Difference and PDR Fusion Algorithm Using Smartphone GNSS Raw Measurements", in *2019 China Satellite Navigation Conference (CSNC) (Oral)*.

A. Rehman, Q. Liu, Z. Wu, H. Zhu, J. Qian, et al. "PDR/GNSS Fusion Algorithm Based on Joint Heading Estimation", in *2019 China Satellite Navigation Conference (CSNC)*.

Z. Wu, P. Liu, Q. Liu, et al. "MEMS-based IMU Assisted Real Time Difference Using Raw Measurements from Smartphone", in *2018 International Technical Meeting of The Satellite Division of the Institute of Navigpation (ION GNSS+)(Oral)*.

A Positioning System under GNSS Double Difference for Portable Intelligent Devices [P]. *Chinese National Invention Patent. (Patent No. CN201810091248.1)*.

RESEARCH

Intelligent Robotic Navigation and Manipulation System
Agency for Science, Technology and Research (A*STAR) of Singapore   *July 2019 - September 2019*

· Developed a docking SLAM method that tracks moving objects with cm-grade docking accuracy for autonomous vehicles.

· Constructed two images handler threads to fuse the masks of object and depth images, and used omnidirectional wheels to avoid large rotation under close range.

· Utilized the low-frequent masks (based on Mask_RCNN) as predictive areas for feature detection, and utilized depth geometry discontinuity and convexity as real-time auxiliary segmentation.

- Such a system was deployed in autonomous factories, to dynamically follow mobile target and then implement docking and mechanical grab.

Multi-sensor Fusion for Inspection Robot
Shanghai Jiao Tong University *December 2018 - Present*

- Introduced a loose-coupled framework that fuses IMU, SLAM, GNSS and other sensors separately, which tolerates single sensor failure during operation.
- Applied an error-state Kalman Filter (ESKF) to optimize the independent poses from SLAM and IMU.
- Loosed the rigid constrain between the world frame and vision frame, and utilized gravity as implicit observation to align SLAM-IMU vision frame to GNSS world frame.
- A second ESKF, sharing the same main state as the first one, was utilized to fuse the GNSS position and Doppler to afford state calibration in long-term operation.
- This algorithm achieved seamless and continuous positioning at large-distance scale (km-grade) when robots move across the indoor and outdoor environments.

Bluetooth Indoor Positioning System
Shanghai Jiao Tong University *August 2018 - October 2018*

- Aimed to realize an accurate Bluetooth signal arrival-of-angle (AOA) estimation, using single channel 6-antenna array.
- Performed the Multiple Signal Classification algorithm (MUSIC) of phase to estimate angles.
- Solved the phase drift problem caused by antenna switch and multipath, by dynamic signal polarization switch and intermittent sampling with frequency compensation.
- The algorithm achieved 5-degree accuracy in estimating the AOA of Bluetooth signal, which means cm-grade localization accuracy could be achieved with this system.

High-accuracy GNSS Positioning on Portable Smartphone
Shanghai Jiao Tong University *July 2017 - August 2018*

- Developed an algorithm which achieved high-accuracy and reliable positioning of smartphones under complex environment using GNSS-IMU fusion.
- Utilized the pseudorange double-difference model (PDD) to linearized the positioning process, and eliminate the atmosphere, satellite, and phone clock error, as well as decoupled the pseudorange and velocity measurements based on the short-baseline hypothesis.
- Joint heading estimation using Pedestrian Dead Reckoning (PDR) and GNSS Doppler.
- This algorithm calibrated the PDR gait length loss and heading drift in the long-term, and maintained high smooth and accuracy in the short-term.

TEACHING EXPERIENCE

Teaching assistant of Digital Signal Processing
Autumn 2018
Instructor: Prof. Xiangming Geng

TECHNICAL STRENGTHS

Programming Languages	C/C++, Python, MATLAB, Java, LaTeX, Markdown
Software Platforms	ROS, Linux, Android, Windows
Hardware Platforms	Jetson, Arduino, NUC, eZdsp 5535

VOLUNTEER ACTIVITY

President of University Volunteer Association
September 2014-July 2016