Erqun Dong

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RESEARCH INTEREST

Robotic State Estimation, Visual SLAM, Multiple Sensor Fusion, Kalman Filtering

EDUCATION

Ph.D., School of Computer Science, McGill University **2020-**
Supervisor: Prof. Xue Liu

Master's Degree, School of Software Engineering, Tsinghua University, Beijing, China **2017 - 2020**
GPA: 3.8/4. Ranking: 7/98
Supervisor: Prof. Zheng Yang, Prof. Yunhao Liu
Research Topic: Indoor localization with visual method, Visual SLAM, Mobile Computing

Bachelor's Degree, Department of Automation, Tsinghua University, Beijing, China **2013 - 2017**
GPA: 88/100. Ranking: 12/145

PUBLICATION

1. **Erqun Dong**, Jingao Xu, Chenshu Wu, Yunhao Liu, Zheng Yang. "Pair-Navi: Peer-to-Peer Indoor Navigation with Mobile Visual SLAM". IEEE INFOCOM 2019. **Best In-Session Presentation Award**
2. Jingao Xu, Hengjie Chen, Kun Qian, **Erqun Dong**, Min Sun, Chenshu Wu, Yunhao Liu, Zheng Yang. "iVR: Integrated Vision and Radio Localization with Zero Human Effort". ACM IMWUT 2019.
3. **Erqun Dong**, Jianzhe Liang, Zeyu Wang, Jingao Xu, Longfei Shangguan, Qiang Ma, Zheng Yang, A paper about indoor visual navigation and crowdsourcing. Submitted to IEEE ICPADS 2020.
4. Jingao Xu, Zheng Yang, Hengjie Chen, **Erqun Dong**, Chenshu Wu, Jianbo Li, Nicholas Lane, "Wireless Indoor Localization with Robust Fingerprints", ACM Transactions on Sensor Networks (TOSN) (to appear)

ACADEMIC EXPERIENCE

Indoor Localization with Visual Methods. Master's Projects

Crowdsourcing-based Indoor Peer-to-peer Navigation (Publication 3) **June - October 2019**
- Mobile application of indoor peer-to-peer navigation based on visual-inertial odometry. Mapping by crowdsourcing.

Indoor peer-to-peer Navigation with Mobile Visual SLAM (Publication 1) **May - July 2018**
- Mobile application of indoor peer-to-peer navigation based on ORB-SLAM, Mask R-CNN for non-rigid context culling
- Navigation success rate of 98.6%, remaining 83.4% after two weeks, outperforming state-of-the-art by > 50%

Indoor Localization with Surveillance Cameras (Publication 2) **May - July 2018**
- Indoor localization with surveillance cameras, Wi-Fi fingerprinting and pedestrian dead-reckoning
- Localization accuracy 0.7m, outperforming state-of-the-art by >70%.

Stereo Visual Tracking of Object for Viscous Grab Using Robot Arm **December 2017**
- Developed real time object tracking via salient color tracking on stereo camera, depth error less than 5 mm, 2%

Robot Control. Bachelor's Projects

Self-balancing Two-wheeled Vehicle. Supervised by Prof. Mingguo Zhao **Sept - Dec 2015**
- State estimation with accelerometer and gyroscope, and self-balancing control using PID. Programmed with LABVIEW
- Built from scratch, including mechanical structure, motor driver circuit design, motor calibration, IMU calibration

Robot Arm Pencil Sketch System. Supervised by Prof. Zongying Shi **May 2016**
- Developed a pencil sketch system with Robot Arm with C++ and Matlab hybrid programming
- Motion planning using inverse kinematics. Visual outline extraction with Laplacian Filter.

INTERNSHIP EXPERIENCE

Powervision Tech Inc, Beijing, China **April - June 2019**

- Developed visual SLAM on drone with a stereo camera. In ARM Embeded System, debugged with cross-platform GDB
- Runtime memory compaction to 200 MB. Efficiency optimization with on-chip hardware Intelligent Video Engine (IVE)

Datang Mobile Communication Equipment Co., Ltd, Beijing, China **July - August 2016**

- Developed the anti-collision algorithm of multiple RFID ISO15693 cards for a single RFID reader
- Designed a new printed circuit board (PCB) Antenna with Altium Designer. Realized longer transmitting range (from 1cm to 10cm) and multiple-card power support (from 2 to 4) by optimizing impedance matching

PROFESSIONAL SKILLS

English

- TOFEL IBT, 111: Reading 30, Listening 29, Speaking 25, Writing 27
- GRE, 325: Verbal 155, Quatitative 170, Writing 3.5

Programming Language

- Experienced in C++, C, Matlab and Android (Java)
- Familiar with Python, C#, Go, Verilog HDL, Assembly Language, Labview and Javascript

MAIN CURRICULUM

Master's Degree:

- Mathematics: Convex Optimization, Matrix Analysis, Stochastic Process
- Programming: Parallel Program Design, Information Visualization (Javascript D3 Library)

Bachelor's Degree:

- Mathematics: Calculus, Linear Algebra, Probability Theory and Mathematical Statistics, Numerical Analysis, Discrete Mathematics, Complex Function Theory, Operations Research
- Electronics: Circuit Principal, Digital Circuit, Analog Circuit, Power Electronics, Signals and Systems Analysis, FPGA and Verilog HDL Programming
- Control Theory: Automatic Control Theory, Linear Control System, Robot Arm Control, Electric Traction System

AWARDS

- Tsinghua-VMware Scholarship, Top 10%, Oct 2019
- Tsinghua University Scholarship for comprehensive performance, Top 20%, Oct 2018
- Excellent Graduate of Department of Automation, Tsinghua University, Top 10%, July 2017
- MCM/ICM (Mathematic Contest In Modeling/ Interdisciplinary Contest In Modeling), Meritorious Winner, Top 10%, Apr 2016
- Tsinghua-Weichai Scholarship, Top 10%, 2016
- Tsinghua University Academic Excellence Award, Top 20%, 2014, 2015
- Electronic Design Contest 3rd prize in Tsinghua University, Top 20%, Nov 2014
- Tsinghua University Sports Exellence Award, Top 7%, 2015. Tsinghua University Social Word Award, Top 7%, 2015