Jiawei Mo

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WORK EXPERIENCE

Amazon Bellevue, WA
Applied Scientist II 06/06/2022 - present

- Amazon Nova Reel Video Generation
  - Large-scale data processing, video generation, spatial-temporal super-resolution, diffusion model distillation
- SLAM
  - Extended VIO for rolling shutter cameras and reduced ATE by 99.8% (orientation) and 94.6% (position)
  - Enabled VIO to initialize from dynamic motion with sub-degree gravity direction error and 1% velocity error
  - Improved VIO computational efficiency by 50% by optimizing the algorithm and implementation

Waymo Mountain View, CA
Perception R&D Intern 05/26/2020 - 09/04/2020

- Developed a sensor fusion algorithm to calibrate various sensors on the fly
- A consistent EKF system for IMU, cameras, and LiDAR with online calibration
- Achieved 0.005-degree orientation error for LiDAR-camera calibration
- Reduced calibration time before each deployment from hours to a few minutes

Facebook Reality Labs Redmond, WA
Research Intern 06/03/2019 - 08/23/2019

- Worked in the SLAM team, developed a simulation system for SLAM research and development
- Generated trajectory and synthesized inertial measurements based on B-spline
- Rendered high-fidelity images from the Replica dataset

University of Minnesota, Twin Cities Minneapolis, MN
Graduate RA/TA 05/29/2017 - 05/29/2022

- RA in the Interactive Robotics and Vision Lab, focused on SLAM and sensor fusion research
- Head TA of C++, linear algebra, data structures and algorithms, and robotics

TempWorks Software Eagan, MN
Software Management Trainee 12/22/2014 - 05/08/2015

- Developed CRM software for staffing management using Meteor and MongoDB

PUBLICATION

First Author

- *Towards a Fast, Robust and Accurate Visual-Inertial Simultaneous Localization and Mapping System* **Dissertation**
- *Continuous-Time Spline Visual-Inertial Odometry* **ICRA 2022**
  - A VIO system with state-of-the-art accuracy and continuous-time pose representation
- *IMU-Assisted Learning of Single-View Rolling Shutter Correction* **CoRL 2021**
  - A neural network that learns rolling shutter correction 10% better
- *Fast Direct Stereo Visual SLAM* **RA-L 2021**
  - A SLAM system with state-of-the-art accuracy and 2x faster than ORB-SLAM2
- *A Fast and Robust Place Recognition Approach for Stereo Visual Odometry Using LiDAR Descriptors* **IROS 2020**
  - A place recognition approach 2x more accurate and 20x faster than BoW in challenging environments
- *Extending Monocular Visual Odometry to Stereo Camera Systems by Scale Optimization* **IROS 2019**
  - A VO system robust to challenging environments and 3x faster than using stereo matching

Co-Author

- *Robot-to-Robot Relative Pose Estimation using Humans as Markers* **AuRo 2021**
- *Design and Experiments with LoCO AUV: A Low Cost Open-Source Autonomous Underwater Vehicle* **IROS 2020**

PATENT

US Patent 10872246B2 (IROS 2017 Poster)

- **SafeDrive:** Recover lane markers when they are invisible (e.g., covered by snow) using multi-view geometry

EDUCATION

- **Ph.D.** (05/2022), **M.S.** (11/2019), **B.S.** (05/2015), Computer Science, University of Minnesota, Twin Cities

REVIEWER

IROS (2017-2022, 2024), **ICRA** (2020-2022, 2024), **RA-L** (2021-2022, 2024), **CoRL** (2022), **COINS** (2022)