

# Jiawei Mo

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## WORK EXPERIENCE

### Amazon - Applied Scientist II

Bellevue, WA | 06/06/2022 - Present

- Amazon Nova
  - Led large-scale AI-based video analysis for Nova video understanding and generation
  - Developed video super-resolution models; conducted diffusion model distillation for improved efficiency
- SLAM
  - Extended VIO to rolling shutter cameras, reducing ATE by 99.8% (orientation) and 94.6% (position)
  - Enabled robust VIO dynamic initialization with  $<1^\circ$  gravity direction error and  $\sim 1\%$  velocity error
  - Improved VIO computational efficiency by 50% via algorithmic and implementation optimizations
- Smart Home Monitoring (Ongoing)
  - Building a smart home monitoring assistant with natural language interaction using generative AI models
  - Developing an autonomous home-patrolling drone with advanced SLAM techniques

### Waymo - Perception R&D Intern

Mountain View, CA | 05/26/2020 - 09/04/2020

- Developed a real-time EKF-based sensor fusion algorithm for IMU, cameras, and LiDAR for online calibration
- Achieved  $0.005^\circ$  orientation error for LiDAR-camera calibration
- Automated a previously labor- and time-intensive manual calibration process before each deployment

### Facebook Reality Labs - Research Intern

Redmond, WA | 06/03/2019 - 08/23/2019

- Developed a simulation environment for visual-inertial SLAM research
- Synthesized 3D trajectories and IMU data using B-splines
- Generated photorealistic video sequences with advanced rendering techniques and datasets

### University of Minnesota, Twin Cities - Graduate RA/TA

Minneapolis, MN | 05/29/2017 - 05/29/2022

- Graduate RA: Conducted SLAM and sensor fusion research in the Interactive Robotics and Vision Lab
- Head TA: Led courses in C++, linear algebra, data structures and algorithms, and robotics

### TempWorks Software - Software Management Trainee

Bloomington, MN | 12/22/2014 - 05/08/2015

- Developed a CRM software for staffing management using Meteor and MongoDB

## EDUCATION

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

## PUBLICATION

### First Author

- |  |                     |
|--|---------------------|
| • <i>Towards a Fast, Robust and Accurate Visual-Inertial Simultaneous Localization and Mapping System</i>  | <b>Dissertation</b> |
| • <i>Continuous-Time Spline Visual-Inertial Odometry</i> <ul style="list-style-type: none"><li>◦ A VIO system with state-of-the-art accuracy while providing continuous-time pose estimation</li></ul>                                       | <b>ICRA 2022</b>    |
| • <i>IMU-Assisted Learning of Single-View Rolling Shutter Correction</i> <ul style="list-style-type: none"><li>◦ A neural network that improved rolling shutter correction accuracy by 10%</li></ul>   | <b>CoRL 2021</b>    |
| • <i>Fast Direct Stereo Visual SLAM</i> <ul style="list-style-type: none"><li>◦ A SLAM system with state-of-the-art accuracy and 2x faster than ORB-SLAM2</li></ul>  | <b>RA-L 2021</b>    |
| • <i>A Fast and Robust Place Recognition Approach for Stereo Visual Odometry Using LiDAR Descriptors</i> <ul style="list-style-type: none"><li>◦ A place recognition approach 2x more accurate and 20x faster than BoW</li></ul>             | <b>IROS 2020</b>    |
| • <i>Extending Monocular Visual Odometry to Stereo Camera Systems by Scale Optimization</i> <ul style="list-style-type: none"><li>◦ A stereo VO system robust in challenging environments and 3x faster than using stereo matching</li></ul> | <b>IROS 2019</b>    |

### Co-Author

- |   |                  |
|---|------------------|
| • <i>Robot-to-Robot Relative Pose Estimation using Humans as Markers</i>                            | <b>AuRo 2021</b> |
| • <i>Design and Experiments with LoCO AUV: A Low Cost Open-Source Autonomous Underwater Vehicle</i> | <b>IROS 2020</b> |

## PATENT

- **US Patent 10872246B2**: Lane marker recovery under occlusion (e.g., snow) using multi-view geometry.

## REVIEWER

**IROS** (2017-2022, 2024), **ICRA** (2020-2022, 2024), **RA-L** (2021-2022, 2024), **CoRL** (2022), **COINS** (2022), **NeurIPS** (2025)