# Timothy Devon **Morris**

Perception Engineer · Applied Mathematician · Roboticist

*Blacksburg, Virginia*

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## Summary

Eager for opportunities to tackle tough perception problems, such as lifelong SLAM and autocalibration. Strong desire to produce systems that deliver value through exceptional user experience. Track record of transforming proof-of-concepts into robust, lasting solutions.

## Work Experience

### Tangram Vision

*Remote*

Senior Perception Engineer

*Jan 2023 - Present*

- Expanded core calibration IP – MetriCal – to LiDAR and IMU modalities, closing 4 new customer contracts valued at $60k per year
- Developed a bespoke LWIR camera calibration solution for a customer, realizing $100k in new professional services revenue in six weeks
- Implemented M-Estimation in MetriCal improving its robustness to outliers
- Implemented B-Splines on Lie Group manifolds for continuous-time state estimation
- Implemented many geometric camera models in MetriCal
- Led perception team in designing and implementing autocalibration solution
- Implemented IMU Preintegration in MetriCal
- Authored several technical blogposts increasing traffic to website by 50% and inbound leads by 25%
- Maintained, developed and shipped Rust code directly to paying customers
- Obsessed over software quality – wrote comprehensive documentation, extensive tests, and beautiful commit messages
- Communicated with asynchronous, remote team authoring dozens of technical PRDs and RFCs
- Implemented many image and LiDAR processing algorithms in Rust

### Torc Robotics

*Blacksburg, Virginia*

Tech Lead - Sensors & Calibration Software

*October 2020 - December 2022*

- Delivered multi-modal calibration toolset, reducing process time from 3.5 days to 0.5 day
- Designed and implemented factor-graph based LiDAR to IMU calibration tool
- Lead two teams in developing a technical solution to the multi-modal calibration problem
- Coordinated with other tech leads in a cross-functional organization to develop 3-year technical roadmap
- Hired, mentored, and onboarded 5 engineers

### Aurora Flight Sciences

*Cambridge, Massachusetts*

Autonomy Engineer

*May 2019 - October 2020*

- Implemented distributed C++ services to perform conflict detection and resolution for detect & avoid applications
- Deployed detect & avoid system to software-in-the-loop and processor-in-the-loop simulations

## Skills & Technologies

### Programming Languages

- Rust
- C++17
- Python
- Bash
- Lua

### Technologies

- GTSAM
- OpenCV
- ROS
- Eigen
- Git
- Linux
- Vim

### Applications

- State Estimation & Tracking
- Graph-Based Probabilistic Modeling
- Multi-Modal Sensor Calibration
- SLAM
- Computer Vision and 3D Reconstruction
- Nonlinear Least-Squares Optimization
- Multi-Modal Fiducial & Detector Design

## Education

### Georgia Institute of Technology

*Remote - Part Time*

M.S. in Computer Science – 4.0 GPA

*Aug 2020 - Dec 2023*

- Implemented self-supervised depth-from-mono and visual odometry neural network for a final project

### Brigham Young University

*Provo, Utah*

M.S. in Electrical Engineering – 4.0 GPA

*April 2017 - August 2019*

- Researched Handoff Problem for UAS
- Researched Monte-Carlo Tree Search for UAS tasks

### Brigham Young University

*Provo, Utah*

B.S. in Applied and Computational Mathematics – 3.94 GPA

*Sept 2011 - April 2017*