

# James Yang

(+1) 213-700-5516 | james.yang92@gmail.com | linkedin.com/in/james-s-yang | james-yang.com

## INDUSTRY EXPERIENCE

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### Pickle Robot Company

Roles: **Director of Autonomy** (Aug. 2023 – Current)

- I lead the autonomy team at Pickle Robot.

### SoundryAI (May. 2023 – Jul. 2023)

- Generative AI-based sound design startup company. My primary contributions were designing and building deep neural network models that approximated human perception of timbral descriptors.

### Alphabet Inc., Seattle, WA (Remote)

#### Google X - Everyday Robots

Roles: **Senior Software Engineer** (Feb. 2022 – Apr. 2023)

- Fixed and improved in-house camera calibration system, reducing calibration errors and uncertainties down to textbook level accuracy. I formulated novel metrics that exposed underfitting/overfitting lens models, underrepresentation in the data sample space, and improper parameterizations in the optimization.
- Researched data collection acceleration in a sensor calibration context using information theoretic first principles. Initial results reduced data needs by 17% while maintaining calibration quality, with a clear path towards further reduction.
- Created and maintained GCP infrastructure for team towards large-scale data processing and ML applications.

### Amazon.com Inc., Seattle, WA

#### Amazon Scout

Roles: **Senior Applied Scientist** (Sep. 2021 – Jan. 2022)

**Applied Scientist II** (Oct. 2017 – Sep. 2021)

#### Leadership

- Served as technical lead for sensor calibrations working towards estimating and maintaining sensor intrinsic and extrinsic for cameras, LiDAR, ToF, and IMU's + magnetometer on the scale of  $\sim 10^3$  AGVs.
- Reviewed high level business requirements, derived goals and metrics from requirements with respect to sensor calibration, and proposed algorithms/processes/solutions to deliver on those metrics.
- Coordinated efforts between multiple teams to develop a calibration maintenance network which serviced the entire robot fleet across four states.
- Led a team of five to develop AWS cloud infrastructure towards an automated debugging and triaging system for quickly addressing in-field failures, leading to actions which reduced manufacturing and maintenance error rates by over 60%.

#### Individual Contributions

- Authored core algorithms for factory sensor calibration via ego-motion estimation.
- Researched and developed algorithms for targetless *in-situ* camera calibration maintenance using only natural features.

### Amazon Prime Air

Roles: **Research Scientist II** (Apr. 2017 – Oct. 2017)

**Research Scientist I** (Jun. 2016 – Apr. 2017)

**Software Dev. Eng. I** (Jul. 2015 – Jun. 2016)

- Developed algorithms and procedures for GNSS/INS sensor calibration in the context of drones.
- Developed testing frameworks for Kalman filters, sensor noise models, and VSLAM pipelines.
- Wrote controllers for visual servoing of drones using fiducials.

### NASA – Stennis Space Center, MS

Roles: **Software Development Intern** (Aug. 2013 – Dec. 2013)

- Remote sensing project. I developed an automation pipeline for training and deploying an unsupervised learning algorithm that processes Landsat 8 and Landsat 9 satellite images and estimates percent imperviousness of coastline.

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## PROJECTS

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### Calico – A visual-inertial calibration library

I authored an open-source visual-inertial sensor calibration library designed for rapid problem construction and debugging. The library is written in C++ and comes with Python bindings.

<https://github.com/yangjames/Calico>

## EDUCATION

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**University of Pennsylvania, School of Engineering and Applied Sciences, Philadelphia, PA**

MSE:	Robotics	May 2015
BSE:	Mechanical & Electrical Engineering	May 2015
Honors:	Magna Cum Laude, Dean's List 2012-2013, Dean's List 2014-2015, Eta Kappa Nu Honor Society	

## SKILLS

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Coding:	C++, Python, MATLAB
Libraries:	Eigen, OpenCV, OpenGV, Pytorch, Torch Lightning, W&B
Proficiencies:	Visual-Inertial Systems, SLAM, SfM, Bundle Adjustment, Computer Vision, Projective Geometry and 3D Kinematics, Non-Linear Least-Squares Optimization