

# Akshay Krishnan

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## EDUCATION

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<b>Ph.D., Robotics</b> <i>School of Interactive Computing, Georgia Institute of Technology</i> GPA: 4.0/4.0 (in progress), Advisor: Prof. James Hays	Aug 2022 – Dec 2026 Atlanta, GA
<b>M.S., Electrical and Computer Engineering</b> <i>Georgia Institute of Technology</i> GPA: 4.0/4.0	Aug 2018 – May 2020 Atlanta, GA
<b>B.Eng., Electronics and Communication Engineering</b> <i>Sri Jayachamarajendra College of Engineering</i> GPA: 9.42/10.0	Aug 2014 – May 2018 Mysuru, India

## EXPERIENCE

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<b>Student Researcher</b> <i>Google Research</i> <ul style="list-style-type: none"><li>Representations and models for open class 3D lifting of 2D objects.</li></ul>	May 2023 – present San Francisco, CA
<b>Computer Vision Engineer</b> <i>Waymo</i> <ul style="list-style-type: none"><li>Stereo vision: trained and deployed a deep model for estimating long-range depth from cameras in real-time.</li><li>Automatic calibration: A framework to calibrate sensors automatically as cars drive in the real world.</li></ul>	June 2020 – Aug 2022 Seattle, WA
<b>Computer Vision Intern</b> <i>Blue River Technology</i> <ul style="list-style-type: none"><li>Researched and implemented geometric approaches for calibration of LiDARs and stereo cameras.</li><li>Developed an algorithm for extrinsic calibration of thermal and RGB cameras.</li></ul>	May 2019 – Aug 2019 Sunnyvale, CA
<b>Software Engineering Intern</b> <i>Amagi Media Labs</i> <ul style="list-style-type: none"><li>Developed a web application to post-process archived videos and extract text from them.</li></ul>	Jan 2018 – May 2018 Bangalore, India
<b>Graduate Research Assistant</b> <i>Georgia Institute of Technology (Advisors: Prof. Frank Dellaert, Prof. Sonia Chernova)</i> <ul style="list-style-type: none"><li>Representations and optimization methods to estimate 3D line structure and camera poses from images.</li><li>GTSfM: a distributed end-to-end global SfM pipeline.</li><li>Human-Robot Collaboration: Quantifying a person's ability to collaborate with robots using</li></ul>	Aug 2019 - May 2020 Atlanta, GA
<b>Summer Research Fellowship</b> <i>SERC, Indian Institute of Science (Advisor: Prof. N. Balakrishnan)</i> <ul style="list-style-type: none"><li>Formulated a model and developed an application to detect vulnerabilities of nearby Wi-Fi networks in real-time.</li></ul>	May 2016 - July 2016 Bangalore, India

## PUBLICATIONS

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- “LANe: Lighting-Aware Neural fields for Compositional Scene Synthesis”, *WACV 3D for science workshop, 2024* [🔗](#)  
Amit Raj\*, **Akshay Krishnan\***, Nikita Jaipuria, Sandhya Sridhar, Alexandra Katherine Carlson, Xianling Zhang, James Hays
- “Distributed Global Structure-from-Motion with a Deep Front-End”, *arXiv 2023* [🔗](#)  
Ayush Baid, John Lambert, Travis Driver, **Akshay Krishnan**, Hayk Stepanyan, Frank Dellaert
- “Taking Recoveries to Task: Recovery-Driven Development for Recipe-based Robot Tasks”, *ISRR 2019* [🔗](#)  
Siddhartha Banerjee, Angel Daruna, David Kent, Weiyu Liu, Jonathan Balloch, Abhinav Jain, **Akshay Krishnan**, Muhammad Asif Rana, Harish Ravichandar, Binit Shah, Nithin Shrivatsav, Sonia Chernova
- “Depth Camera based Autonomous Mobile Robot for Indoor Environments”, *IEEE I2CT 2018* [🔗](#)  
**Akshay Krishnan**, Sowrabh Nayak, Anup Rao, Sudarshan Patilkulkarni

## PROJECTS

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### Lighting-aware composable object NeRFs for self-driving scenes

- Using controllable and composable NeRFs for new-view synthesis.

### GTSfM: A library for large-scale parallelized Structure-from-Motion using factor graphs

- Developed an optimizer to estimate global translations of cameras from two-view translation directions.
- Implemented the 1DSfM outlier rejection algorithm to reject noisy translation directions before optimization.

### FetchIt! Mobile Manipulation Challenge, ICRA 2019 (*1<sup>st</sup> place Winner*)

- Developed a ROS based framework for indoor localization and navigation of the Fetch mobile manipulator.

### Learning disentangled motion and content representations from unlabeled videos

- Proposed a deep model and a self-supervised loss to learn representations for the motion and content in videos.
- Evaluated the performance of the model on downstream tasks like action recognition and action transfer.

### PointNav: Embodied point-to-point navigation in unseen environments (*Habitat Challenge, CVPR 2020*)

- Trained a deep network to estimate an agent's pose and 2D map of environment from noisy depth and odometry.
- Evaluated performance of the network when used with an RL policy on unseen scenes from Gibson 3D dataset.

### Handwriting classification using line and texture-based features

- Designed and extracted geometric features from handwriting to be used with a classifier for writer recognition.

### Multi-robot teams for surveillance of an area

- Designed scalable local behaviors for multi-robot teams to patrol and protect an area using networked control.
- Demonstrated results on real robots at the GaTech Robotarium.

### Robots to collect farm produce (*4<sup>th</sup> place, E-Yantra National Robotics Competition, IIT Bombay, 2018*)

- Implemented perception algorithms for robots to pick fruits from a farm and drop them in a truck.

### Depth camera based autonomous mobile robot for indoor environments

- Implemented localization and path planning algorithms for indoor navigation using depth and odometry data.

## TECHNICAL SKILLS

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**Programming Languages:** C++, Python, C, MATLAB, HTML, JavaScript  
**Libraries and Tools:** PyTorch, TensorFlow, scikit-learn, NumPy, Matplotlib, ROS, Git, OpenCV, Point Cloud Library, OpenAI Gym, OpenMP, MPI, OpenGL

## AWARDS

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- **1st prize**, FetchIt! Mobile Manipulation challenge, ICRA 2019 (team award)
- **4th prize**, e-Yantra National Robotics Challenge, IIT Bombay, 2018 (team award)
- **Summer Research Fellowship**, Indian Academy of Sciences, 2016

## LEADERSHIP

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- Served as Editor-in-Chief at IEEE SJCE Student Branch's editorial board for 2017-18.
- Led a team to the finals of the e-Yantra Robotics Competition 2018 held at IIT Bombay.
- Volunteered to teach children at orphanages for IEEE-SJCE's social initiative 'Prayas'.