

Akshay Krishnan

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EDUCATION

M.S., Electrical and Computer Engineering

Georgia Institute of Technology

GPA: 4.0/4.0

Aug 2018 – May 2020

Atlanta, GA

B.Eng., Electronics and Communication Engineering

Sri Jayachamarajendra College of Engineering

GPA: 9.42/10.0

Aug 2014 – May 2018

Mysuru, India

RESEARCH EXPERIENCE

Graduate Research Assistant

Georgia Institute of Technology (Advisor: Prof. Sonia Chernova)

Jan 2020 – May 2020

Atlanta, GA

- Investigated whether people's reaction times to sequences of visual stimuli could predict their ability to collaborate with a team of robots by conducting online human behavior studies.

Graduate Student Researcher

Georgia Institute of Technology (Advisor: Prof. Frank Dellaert)

Aug 2019 – May 2020

Atlanta, GA

- Developed a visual SLAM pipeline for estimating camera poses by tracking 3D lines using factor graphs for optimization.

Summer Research Fellow

SERC, Indian Institute of Science (Advisor: Prof. N. Balakrishnan)

May 2016 – July 2016

Bangalore, India

- Formulated a model and developed an application to detect vulnerabilities of nearby Wi-Fi networks in real time.

INDUSTRIAL EXPERIENCE

Software Engineer, Perception

Waymo

June 2020 – Present

Seattle, WA

- Developed algorithms and tools to improve and evaluate calibration of cameras in a natural scene without targets.
- Optimized and deployed a deep network for multi-view depth prediction onboard the car.

Computer Vision Engineering Intern

Blue River Technology

May 2019 – Aug 2019

Sunnyvale, CA

- Researched and implemented geometric approaches for calibration of LiDARs and stereo cameras.
- Developed an algorithm for extrinsic calibration of thermal and RGB cameras.

Software Engineering Intern

Amagi Media Labs

Jan 2018 – May 2018

Bangalore, India

- Developed a web application to process videos and extract text from natural scenes before archiving them.

Engineering Intern

Toyota

May 2017 – July 2017

Bangalore, India

- Developed an embedded controller for a Rail Guided Vehicle to transport parts on the manufacturing floor.

TEACHING

Graduate Teaching Assistant

College of Computing, Georgia Institute of Technology

Aug 2019 – Dec 2019

Atlanta, GA

- Held office hours and graded assignments and projects for CS 4641: Machine Learning.

PROJECTS

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.

FetchIt! Mobile Manipulation Challenge, ICRA 2019 (*1st place Winner*)

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

Robust translation averaging for Structure from Motion using factor graphs

- Implemented an algorithm to estimate global translations of cameras from relative unit translations obtained by matching point features in a way that is robust to outliers.

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 approach on downstream tasks like action recognition and action transfer.

Multi-robot behaviors 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 (*4th place, E-Yantra National Robotics Competition, IIT Bombay, 2017*)

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

Handwriting classification using line and texture-based features

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

Depth camera based autonomous mobile robot for indoor environments

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

PUBLICATIONS

- “Taking Recoveries to Task: Recovery-Driven Development for Recipe-based Robot Tasks”, 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, *International Symposium on Robotics Research (ISRR)*, 2019
- “Depth Camera based Autonomous Mobile Robot for Indoor Environments”, Akshay Krishnan, Sowrabh Nayak, Anup Rao, Sudarshan Patilkulkarni, *International Conference for Convergence in Technology (I2CT)*, 2018
- “Text-Independent Handwriting Classification Using Line and Texture-Based Features”, T Shreekanth, MB Punith Kumar, Akshay Krishnan, *Springer Lecture Notes in Computational Vision and Biomechanics*, 2018
- “Design and Implementation of Robotic Vision for Face Recognition”, Akshay Krishnan, Ananya HS, *International Conference on Circuits, Controls, and Communications (CCUBE)*, 2017

TECHNICAL SKILLS

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

- **Summer Research Fellowship**, Indian Academy of Sciences, 2016.

LEADERSHIP

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