Kaushik Shivakumar

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Education

2022 - 2023: UC Berkeley | Graduate: 5th Year Masters' Program, AUTOLAB - Advisor: Prof. Ken Goldberg

2019 - 2022: UC Berkeley | Undergraduate, EECS Class of 2022, Regents' and Chancellor's Scholar; GPA: *4.0/4.0*

Sp 2022: EE 128: Feedback Control Sys., EECS 106B: Robotic Manipulation and Interaction, CS 267: Applications of Parallel Computers
Fa 2021: CS 285: Deep Reinforcement Learning, CS 162: Operating Sys. and Sys. Programming, EE 120: Signals and Systems
Sp 2021: CS W186: Introduction to Database Systems, CS 189: Intro. to ML, EECS 127: Optimization Models in Engineering
Fa 2020: CS 61C: Machine Structures, EECS 126: Probability and Rand. Processes, CS 170: Efficient Algorithms and Intractable Problems
Sp 2020: CS 61B: Data Structures, EECS 16B: Designing Info. Devices and Systems II, CS 70: Discrete Math and Probability Theory
Fa 2019: CS 61A: Structure and Interp. of Comp. Progs, EECS 16A: Designing Info. Devices and Systems I, Math 53: Multivar. Calc.

Class of 2019: The Harker School (High School Valedictorian): Class Rank: 1; GPA: *Weighted: **4.69/4.8**, Unweighted: **4.0***

Research & Work Experience

Summer 2022: Software Engineering Intern at *Google, Inc.*
Studying epistemic uncertainty estimation in deep neural networks in the Google Brain team.

Spring 2021 - present: Researcher at AUTOLAB at UC Berkeley
Developed machine learning-based algorithms and pipelines to enable robots to perform complex tasks such as cable manipulation and untangling, as well as garment smoothing and folding.

Fall 2019 - present: Undergraduate Researcher at *RISE Lab* at UC Berkeley
Devising program transformations to automatically optimize distributed protocols based on their dataflow graphs.

Fall 2019 - present: Software Engineering Intern for *ZeroUI, Inc.*
Designed & developed a fully-online Python IDE for programming robots in a 3D virtual world (zirostudio.com). Led a group of 5 interns.

Summer 2021: Machine Learning Engineering Intern at *Snorkel AI*, Inc.
Enabled the Snorkel weak supervision pipeline to support analysis of customers' time series data by finding an optimal problem formulation, building infrastructure to support the new data modality, and working with customers on models to meet their requirements.

Summer 2020: Software Engineering Intern at *Google, Inc.*
Implemented and studied the performance of different attention-based deep learning model architectures on object recognition and action recognition in single frames and videos, working with the Video Inventory Analytics Content Understanding team and Google Research.

Summer 2017: Software engineering internship at Laserlike, Inc.
Developed a backend server in Go. Gained experience with code reviews, writing production code, using version control, and collaborating with a large team of engineers to develop a product.

Publications

* Equal contribution

1. Vainavi Viswanath*, Kaushik Shivakumar*, Justin Kerr*, Brijen Thananjeyan, Ellen Novoseller, Jeffrey Ichnowski, Alejandro Escontrela, Mike Laskey, Joseph E. Gonzalez, and Ken Goldberg. "Autonomously Untangling Long Cables", RSS 2022 *Best Systems Paper Award* recipient.

2. Ryan Hoque*, Kaushik Shivakumar*, Shrey Aeron, Gabriel Deza, Aditya Ganapathi, Adrian S. Wong, Johnny Lee, Andy Zeng, Vincent Vanhoucke, and Ken Goldberg. "Learning to Fold Real Garments with One Arm: A Case Study in Cloud-Based Robotics Research." ArXiv abs/2204.10297 (2022). Accepted into IROS 2022.

3. Kaushik Shivakumar. "A statistical approach to correlating environmental and demographic factors to cancer incidences." (2018). IEEE BIBM Conference. Talk presented at MABM workshop (Madrid). Abstract published in AACR 30th Annual Special Conf Convergence.

4. B. Rister, D. Yi, K. Shivakumar, T. Nobashi, and D. L. Rubin. "CT organ segmentation using GPU data augmentation, unsupervised labels and IOU loss." arXiv preprint arXiv:1811.11226 (2018).

Honors and Awards

- 2023 Siebel Scholar
- Best Systems Paper Award at Robotics Science and Systems 2022
- Regents and Chancellor's Scholar, UC Berkeley
- Valedictorian, Class of 2019, The Harker School
- Intel Excellence in Computer Science Award at 2018 Synopsys Science & Technology Championship

- VEX Robotics Competition 2013-2019 - 11-time regional tournament champion, 2-time California state champion, 2019 Worlds division finalist.

Projects

1. Ryan Adolf*, Tarun Amarnath*, Jeremy Hughes*, and Kaushik Shivakumar*. "[TASI: Terrain-Aware System Identification for Autonomous Navigation of Wheeled Robots](#)." EECS 106B final project (2022).
2. Simeon Adebola*, Satvik Sharma*, Kaushik Shivakumar*. "[DEFT: Diverse Ensembles for Fast Transfer in Reinforcement Learning](#)." CS 285 final project (2021).
3. "A Weak Supervision Machine Learning Approach to Classification Using an XGBoost Model". Advised by Dr. Stephen Bach, Postdoc at Stanford University. Presented at Synopsys Science Fair 2018. Also developed and deployed a public Twitter hate speech detector using weak supervision.

Programming Experience

Primary Languages

Python: Used in several courses, have written (and still writing) code for ML & deep learning, research and internships.

C: Learned & used in college and high school classes, worked on multiple projects (including Numpy implementation, .wav file filtering, VEX robot programming).

Java: Used in college and high school coursework, Android Studio App Development (self-learned), Coursera algorithms course.

Platforms/Skills/Other Languages

Jupyter Notebook, Javascript, Go, C++, Matlab, SQL, Unix, BASIC, Fortran, Mathematica, Firebase, Google Cloud, Arduino, Kubernetes, PROS (Purdue Robotics Operating System), Docker, Android Studio, LaTeX, JESS (Java Expert System Shell), RobotC, HTML, Fortran

Leadership

- Organizer of 6+ VEX Robotics tournaments (where I also developed and deployed systems for automating queuing and announcement systems) and 5 all-girls VEX Robotics workshops in collaboration with Google and the RECF.
- Accepted to REC Foundation Student Advisory Board (2019-2021), consulted on improving the reach and appeal of the VEX Robotics Competition to students.
- Founded *Robotics Without Limits*: roboticswithoutlimits.org in 2017, a nonprofit to conduct robotics workshops for children with special needs in collaboration with ZeroUI, a Silicon Valley robotics startup.
- Harker Middle School Science Bowl Head Coach (2017-2019), Coach (2015-2017).