PRANAV SUKUMAR

https://pranav-sukumar.github.io/ | 425.753.4467 | pranav.sukumar@columbia.edu | www.linkedin.com/in/pranav-sukumar/

EDUCATION

Columbia University   GPA: 4.1
M.S. in Computer Science, Machine Learning Track   (Aug 2023 – Dec 2024)
- Relevant Coursework: High Performance Machine Learning, Robot Learning, Computer Vision, Computational Imaging, Networks, Virtual Reality and Augmented Reality.

University of California, Berkeley   GPA: 3.9
B.S. in Electrical Engineering and Computer Sciences (EECS), Minor in Data Science   (Aug 2019 – May 2023)
- Relevant Coursework: Machine Learning, Artificial Intelligence, Operating Systems, Robotics, Databases, Algorithms, Data Structures, Graphics, Computer Architecture, Data Science, Discrete Math, Probability, Multivariable Calculus.

INDUSTRY EXPERIENCE

Databricks (Delta Sharing Team) | Software Development Engineer Intern   (May 2024 – Aug 2024)
- Worked on Delta Sharing which is a part of the Delta Lake foundation.
- Added support to the open-source Delta Sharing server and client-side connector to support sharing tables with Deletion Vector and Column Mapping features.
- Added limit and JSON predicate hint pushdown on the server to optimize query processing.
- This was requested by 250+ Databricks customers and my work can be found on the Delta Sharing open source repository.
- Prototyped cloud token sharing in open-source Delta Sharing client-side connector as a stretch project.

Amazon Robotics | Returning Software Development Engineer Intern   (May 2023 – Aug 2023)
- Expanded my previous internship project by connecting augmented reality device to the PC controlling production workflow.
- Built a system that uses DynamoDB to securely send and receive data between the device and Fulfillment Center Station PCs.
- Networking system was extensible and scalable allowing it to be utilized in other projects and parts of the production workflow.

Amazon Robotics | Software Development Engineer Intern   (May 2022 – Aug 2022)
- Built an Augmented Reality application for the Microsoft HoloLens 2 to replace current infrastructure in a robotic workcell.
- The augmented reality application replaced a complex network of proprietary cameras, lighting devices, and overhead canopies.
- Developed workcell localization, interaction detection, and a user interface in Augmented Reality using C#.
- Applied for a design patent; This project saves ~ $1 million per Amazon Delivery Center.

Apple (Siri Response Framework Team) | AI/ML Intern   (Jan 2022 – April 2022)
- Authored Swift programs showcasing the complete set of new APIs for use by Apple internal developers.
- Addressed enhancements and bugs in Siri Response Framework as a part of iOS 16.0.
- Proposed different Machine Learning algorithms for Siri Modes Classification and wrote a research report justifying the changes.

Nvidia (GPU Network Cloud Infrastructure Team) | Returning Software Engineer Intern   (June 2021 – Aug 2021)
- Developed secure end-to-end automation of Windows KMS Volume Activation for NVIDIA GeForce Now machines.
- Used Terraform and Python to automate the creation of AWS EC2 instances, VPCs, Subnets, and Security Groups.
- Developed a Jenkins Pipeline to build, deploy, and test the Windows KMS Volume Activation automation.

Nvidia (GPU Network Cloud Infrastructure Team) | Software Engineer Intern   (May 2020 – Aug 2020)
- Improved monitoring capabilities for cloud services by writing Golang programs to expose CPU performance and event metrics.
- Scraped exposed metrics for Prometheus to build visual Grafana dashboards for the NVIDIA GPU Network platform.
- Tested and deployed code on Docker containers running under Kubernetes on virtual machines in a Linux environment.

Expedia (Search and Suggest Team) | Software Development Intern   (Jun 2018 – Aug 2018)
- Worked on both front-end and back-end capabilities to improve Expedia's homepage search experience.
- Developed inline categorization of the types of search results, a heuristic-based location estimator to tailor search results, and a customer feedback tool to receive feedback regarding the quality of search results.
- About 700,000 customers per week interact with the features I built.

Project Manager | Data Science Society at Berkeley   (Sep 2019 – Present)
- Led consulting team that built NLP models for *Fansure* to detect NBA & MLB teams referenced in articles.
- Analyzed past marketing campaigns and built ML models to predict the effectiveness of future campaigns for *Monday.com*.
- Used unsupervised learning and EDA for *Paypal* to analyze their internal company rewards system.
- Developed a chatbot for Oust Labs: Optimized NLP algorithms in a Chatbot integrated with Dialogflow, Rasa X, and GCP.

RESEARCH EXPERIENCE

Columbia University Computer Graphics and User Interfaces Lab | Graduate Researcher   (Aug 2023 – Present)
- Developed a VR application for infant lumbar puncture training that provides procedure visualizations and feedback for trainees.
- First author of paper published in 31st IEEE Conference on Virtual Reality and 3D User Interfaces Conference.

UC Berkeley Game Theory (GamesCrafters) Lab | Undergraduate Researcher   (Aug 2022 – May 2023)

- Worked on a project that combines augmented reality and game theory to aid in optimal play of a physical board game.
- Implemented board game detection, built localization of the board game, and trained a neural network to detect game pieces.

UC Berkeley Algorithms and Computing for Education (ACE) Lab | Undergraduate Researcher   (Aug 2021 – Aug 2022)
- Designed and implemented algorithms for cheating detection and computer-based testing.
- Presented a poster of my research at the 53rd ACM Technical Symposium on Computer Science Education (SIGCSE) conference.

University of Washington Personal Robotics Lab | Undergraduate Researcher   (May 2020 – Dec 2020)
- Worked with the Assistive Dexterous Arm robot that performs assisted feeding for people with upper-extremity impairments.
- Wrote a Hidden Markov Model (HMM) to predict when a person needs to be fed by the robotic arm.
- Used computer vision algorithms to extract features for the HMM including body pose and facial expressions.

PATENTS & PUBLICATIONS

31st IEEE Conference on Virtual Reality and 3D User Interfaces Conference   (Mar 2023)
- [Visual Guidance for Infant Lumbar Puncture Training in XR](#) research demo presented at conference and extended abstract published in conference proceedings.

Design Patent Pending | Amazon.com (Amazon Robotics)   (Aug 2022)
- Applied for a design patent through Amazon Robotics for my summer internship project (described in "Industry Experience").
- Patent application made it through the first round of reviews at Amazon.com.

53rd ACM Technical Symposium on Computer Science Education (SIGCSE) Conference   (Mar 2022)
- [Improved Testing of PrairieLearn Question Generators](#) abstract and poster published on ACM Digital Library.

TEACHING EXPERIENCE

TA for Database Systems (COMS 4111) | Columbia CS Department   (Aug 2023 – Dec 2023)
- Debug student code in office hours for project implementing a database application with a web front-end.
- Created and maintained the class PostgreSQL server running in a cloud VM.

TA for Database Systems (CS 186) | UC Berkeley EECS Department   (Aug 2022 – Present)
- Teach weekly sections, explaining database management system theory and algorithms from class including B+ Trees, Buffer Management, Query Optimization, Recovery, Parallel Query Processing, Distributed Transactions, and Distributed Systems.
- Debug student code in office hours for Java Project implementing a Database Management System with a B+ tree index, System R query optimizer, concurrency, and an ARIES recovery manager.
- Edit course notes and textbook by adding new content presented in lecture and example problems with solutions.

Reader for Computer Security (CS 161) | UC Berkeley EECS Department   (Jan 2022 – May 2022)
- Course topics include: Memory Safety Vulnerabilities, Cryptography, Block Ciphers, Hashes, MACs, Certificates, CSRF, SQL Injection, Networking, DNSSEC, Firewalls, Blockchain.
- Reviewed student design documents for a project building an End-to-End Encrypted File Sharing System in Golang.

PROGRAMMING PROJECTS OUTSIDE COURSEWORK, RESEARCH, AND INTERNSHIPS

- [Mater](#): An autonomous RC car that explores an unknown environment and performs pick and place tasks with a custom gripper.
- [Edify](#): A Web App for instructors to upload a Zoom video recording and receive an email report of 4 student metrics: attention, emotion, topics of discussion, and common questions. Uses OpenCV, LDA, and IBM Watson to perform analysis.
- [Signify](#): A Voice to ASL (American Sign Language) Translation App that enables enhanced live-lecture for members of the ASL-speaking community by intelligently converting a professor's speech to a sequence of ASL videos for the user to watch.
- [RecipieBot](#): A chat-bot on compatible with Google Assistant that recommends recipes based upon spare ingredients a user inputs. The bot has been trained on more than 1000 ingredients.
- [GradeScoper](#): A chrome extension that scrapes Gradescope for assignment deadlines and adds them to Google Calendar.

AWARDS AND HONORS

- Eta Kappa Nu (HKN) Honor Society: Top 1/3 of senior-standing EECS students. Plan career fairs and company tech talks as a member of the Industry Relations committee.
- Honors to Date distinction for overall GPA in the top 20 percent of the College of Engineering; Dean's Honors List.
- Hack'20 Hosted by DubHacks (2020): Received the Google Cloud COVID-19 Hackathon Fund award for the project Edify.
- Cal Hacks 6.0 Sponsor Award Winner - Best Use of the Weights and Biases API (2019): Won the award, in a competition of 2000 students, for building an ensemble model of existing text-to-speech options for project Signify.
- U.S. Presidential Scholars Semifinalist (2019): One of 620 out of ~3.6M high school seniors selected by the White House Commission on Presidential Scholars and the US Dept. of Education based on academics and perfect standardized test scores.
- Georgia Tech Gold Scholarship (2019): The Georgia Tech Gold Scholarship is offered annually to the top 0.5% percent of high school seniors from across the United States who apply to Georgia Tech.

PROGRAMMING LANGUAGES: Python, C, Java, Scala, Go, C#, Swift, JavaScript, HTML/CSS, SQL
TOOLS, TECHNOLOGIES, AND LIBRARIES: Git, Docker, Kubernetes, Terraform, Packer, Jenkins, NumPy, Pandas, PyTorch