PRANAV SUKUMAR

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EDUCATION

University of California, Berkeley **GPA: 3.857**

B.S. in Electrical Engineering and Computer Sciences (EECS), Minor in Data Science **(Aug 2019 – May 2023)**

- Relevant Coursework: Machine Learning, Operating Systems and Systems Programming, Introduction to Artificial Intelligence, Introduction to Database Systems, Computer Security, Efficient Algorithms and Intractable Problems, Introduction to Robotics, Principles and Techniques of Data Science, Discrete Mathematics and Probability Theory, Great Ideas in Computer Architecture, Data Structures and Algorithms, Structure and Interpretation of Computer Programs, Foundations of Data Science, Designing Information Devices and Systems II, Designing Information Devices and Systems I, Multivariable Calculus, Physics (E&M).

Nikola Tesla STEM High School, Redmond, WA **GPA: 4.0**

(Ranked #14 Public School In USA) **(Sep 2015 – Jun 2019)**

- ACT: 36 Composite, 36 on each section (Math, Science, English, Reading); SAT Subject Tests: Math II - 800, Biology - 800.

INDUSTRY EXPERIENCE

Software Development Engineer Intern | Amazon.com (Amazon Robotics) **(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.
- Research project that involved structuring and defining the research problem from a one-line description, outlining goals for the project, and defining measures of success.
- 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.

AI/ML Intern | Apple (Siri Response Framework Team) **(Jan 2022 – April 2022)**

- Authored multi-thousand-line 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.

Returning Software Engineer Intern | Nvidia (GPU Network Cloud Infrastructure Team) **(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.

Software Engineer Intern | Nvidia (GPU Network Cloud Infrastructure Team) **(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.

Software Development Intern | Expedia (Search and Suggest Team) **(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

Undergraduate Researcher | UC Berkeley Game Theory (GamesCrafters) Lab **(Aug 2022 – Present)**

- Supervised by Professor Dan Garcia.
- Working on a project that combines augmented reality and game theory to aid in optimal play of a physical board game.
- Wrote research proposal for augmented reality project (approved by research advisor) that defined and structured the research problem, listed the goals for the research, and defined measures of success.
- Implemented board game detection, built localization of the board game, and trained a neural network to detect game pieces.
- Implemented game theory algorithms in Python to create clear visualizations and to help onboard new members.

Undergraduate Researcher | UC Berkeley Algorithms and Computing for Education (ACE) Lab **(Aug 2021 – Aug 2022)**

- Supervised by Professor Dan Garcia.
- 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.

Undergraduate Researcher | University of Washington Personal Robotics Lab **(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

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 (CS 186) | UC Berkeley EECS Department **(Aug 2022 – Present)**

- Course taught by Professor Alvin Cheung.
- 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 taught by Professor Nicholas Weaver.
- 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.
- Wrote and graded exam and homework questions.

Academic Intern for Data Structures (CS 61B) | UC Berkeley Department of EECS **(Aug 2021 – Dec 2021)**

- Course taught by Professor Paul Hilfinger.
- Taught small sections of five students, reinforcing data structures and algorithms concepts like Object Oriented Programming, Runtime Analysis, Hashing, Trees, Shortest Path, Graph Traversal, Heaps, and Sorts.
- Helped students debug Java projects and homework in labs.

Volunteer Computer Science Instructor | CoderDojo **(Aug 2015 – Jun 2019)**

- Taught children from disadvantaged backgrounds Java, Python, and Scratch in free weekly classes at local libraries.
- Invited to teach in Chennai, India over summer.

PROGRAMMING PROJECTS OUTSIDE COURSEWORK 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, Go, C#, R, Scheme, JavaScript, HTML/CSS, SQL

TOOLS, TECHNOLOGIES, AND LIBRARIES: Git, Docker, Kubernetes, Terraform, Packer, Jenkins, NumPy, Pandas, PyTorch