Amol Budhiraja

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Education

University of California, Berkeley — Berkeley, CA

Bachelor of Science in Electrical Engineering and Computer Sciences — *Aug. 2021 – May 2025*

- **Relevant Coursework:** Operating Systems, Computer Security, Computer Architecture, Database Systems, Data Structures and Algorithms, Machine Learning, Computer Vision, Data Science, Discrete Mathematics and Probability Theory, Signals and Systems, Designing Information Systems and Devices I/II, Digital Design, Optimization Models.
- **Extracurriculars:** VP of Education: Mobile Developers of Berkeley (2022-Present). Lab Assistant and Section Leader: CS61A, CS61B, EECS16A Courses (2021-22). Technical Director: Berkeley Engineering Student Council (2021-22).

Professional Experience

Software Engineering Intern — Jun. 2024 – Present

Meta — *Menlo Park, CA*

- Engineered the backend of a new platform for businesses to configure and customize large language model (LLM) AI agents to fully automate their customer service capabilities. Applied Hack (PHP) and GraphQL alongside the Ent framework to develop the entire messaging workflow and designed a scalable, multi-threaded system robust to high traffic and utilization, ensuring seamless integration and high performance with 2x speedup across platforms with billions of users.
- Integrated AI-driven response mechanisms into Messenger and WhatsApp, leveraging machine learning to improve user engagement and business communication.

Undergraduate Researcher — Aug. 2023 – Present

Berkeley Netsys Lab — *Berkeley, CA*

- Spearheaded the development of a Large Language Model to optimize IoT device programming and usage based on the digispace paper insights. Integrated various NLP models including Sentence Transformers, Tokenizers, and pioneered vectorized search techniques, enhancing query accuracy and optimizing device-to-query mapping.

Software Engineering Intern — May. 2023 – Aug. 2023

Apple — *Cupertino, CA*

- Developed a robust, full-stack MacOS/CLI application using Swift and Python, streamlining the extraction, prediction, and data visualization of user discomfort metrics utilizing complex mathematical algorithms for Apple Vision Pro.
- Innovated and configured a suite of 25+ computer vision algorithms to analyze metrics like optical flow, effectively expediting research and development cycles by over 24 months, thereby significantly minimizing engineering resource allocation.
- Achieved 3x performance optimization using Image Pyramid techniques and pre-processing algorithms like Gaussian Filtering. Led software product through the entire software development lifecycle and is now a cornerstone in the workflows and pipelines employed by 10+ teams across Apple.

Projects

PintOS | *Operating System* | *C, x86 Assembly* — May. 2024

- Built a robust, fully operational operating system. Enhanced multithreading support, achieving a 30% increase in task execution speed by optimizing thread scheduling and synchronization mechanisms. Implemented virtual memory management and dynamic memory allocation, improving memory utilization efficiency by 40%.
- Developed support for recursive file systems and floating-point operations and provisioned synchronization support with mutexes and condition variables, reducing race conditions and ensuring data integrity across concurrent processes.

Her Health App | *iOS App* | *Swift* — Aug. 2022

- Programmed a mobile application using Swift to help promote the NPO's resources, services, and activities to patients.
- Integrated push notifications, image caching, dynamically rendered components and views, and web scraping. Utilized AVFoundation, RESTful APIs, Postman, Pusher, Firebase, Apple Push Notification Service, and SwiftUI.

Technical Skills

Languages: Python, C, C++, Java, Swift, Rust, Go, x86, RISC-V, SQL/NoSQL, MongoDB, JavaScript, TypeScript, Hack, GraphQL, Scheme, Latex, and Git.
Frameworks/Libraries: PyTorch, OpenCV, NumPy, Pandas, Anaconda, Sklearn, PIL, TQDM, JDBC, Flask, Springboot, OpenMP/OpenMPI, Multiprocessing, Tesseract, React.JS/Next.JS, Swift, Express.js, MapReduce, Spark, Springboot, Node.JS, React Native, MySQL, PostgresSQL, SQLlite, MongoDB, Firebase, ZSH/Bash Scripting, TailwindCSS, Splunk, Docker, Jenkins, AWS, GCP, CvxPy, and Kubernetes.