

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, Artificial Intelligence, Computer Vision, Data Science, Discrete Mathematics and Probability Theory, Signals and Systems, Designing Information Systems and Devices I/II, 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 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), React, and GraphQL alongside the Ent framework to develop the entire messaging workflow, UI, 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.
- Revolutionized the caching infrastructure for Messenger and WhatsApp's AI-driven response systems, optimizing the platforms to efficiently manage high-frequency messaging and real-time retrieval augmented generation (RAG) from business product catalogs.

Undergraduate Researcher

Aug. 2023 – Present

Berkeley Netsys Lab

Berkeley, CA

- Spearheaded the development of a Large Language Model to optimize IoT device programming on kubernetes clusters 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.
- 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%.
- Implemented 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.

Sudoku Solver | *Desktop Application* | C++, OpenCV, Tesseract

Jan. 2023

- Engineered a robust image pre-processing pipeline utilizing techniques like dilation and contour detection, which significantly minimized noise and enhanced the model's ability to distinguish between filled and empty cells.
- Developed a hybrid model combining Convolutional Neural Networks (CNNs) and K-Nearest Neighbors (KNNs) to achieve 95% accuracy in detecting game state. Implemented a recursive backtracking algorithm to efficiently solve the board.

TECHNICAL SKILLS

Languages: Python, C, C++, Java, Hack/PHP, Swift, Rust, Go Lang, x86, RISC-V, SQL/NoSQL, MongoDB, JavaScript, TypeScript, GraphQL, Scheme, Latex, and Git.

Frameworks/Libraries: PyTorch, OpenCV, NumPy, GraphQL, 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, SQL, PostgreSQL, MongoDB, Firebase, ZSH/Bash Scripting, TailwindCSS, Splunk, Docker, Jenkins, AWS, GCP, CvxPy, and Kubernetes.