Dwijen Chawra

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Education

Purdue University **Graduating May 2026**

B.S. in Computer Science, Specializing in Machine Intelligence + Systems *West Lafayette, IN*

Relevant Coursework: ML Systems*, Operating Systems, Data Structures and Algorithms, Systems Programming, Computer Architecture, Artificial Intelligence, Probability, Linear Algebra, Discrete Math, Statistics, Calculus I-III

Clubs: Purdue Hackers, Machine Learning @ Purdue, Purdue Founders ** graduate-level coursework*

Experience

Software Engineering Intern **May 2024 – Present**

Arta Finance *Mountain View, CA*

- Automated local volatility models for exotic options pricing, reducing error to 0.X% and adding $XMM in monthly AUM.
- Engineered the first-ever automated financial advisor and portfolio optimizer with real-time WEBRTC audio, sub-second latency in conversations using locally hosted large language models (LLMs), achieving 97% data extraction accuracy.
- Improved research efficiency by 4x through the integration of JupyterHub on Kubernetes, optimizing compute resource usage and reducing load times for data science workflows.

Undergraduate Teaching Assistant **Aug 2024 – Present**

Purdue University *West Lafayette, IN*

- Instructed 45 students in Computer Architecture, conducted weekly labs, and evaluated x86-64 Assembly coursework. Debugged student code using GDB, mentoring students on advanced systems and architecture topics.

Student HPC Engineer **Aug 2022 – Aug 2024**

Rosen Center for Advanced Computing - Purdue University *West Lafayette, IN*

- Designed and implemented a 5PB Ceph Storage cluster and a 1000-node supercomputer, executing performance profiling and benchmarking for GPU and Infiniband fabric optimization.
- Streamlined the deployment of JupyterHub on the Anvil Kubernetes Cloud, reducing the onboarding time for over 1,200 data scientists by 50%.

Student Researcher **Sep 2020 – Aug 2023**

Stanford Center for Sleep Sciences and Medicine *Palo Alto, CA*

- Conducted extensive analysis on 20TB of sleep EEG data from 3,000+ participants using Random Forest algorithms and SLURM for large-scale batch processing.
- Discovered significant correlated features indicative of high-quality sleep, resulting in 3 peer-reviewed publications in top-tier scientific journals over a three-year period.

Projects

Bourne Shell | *C, C++* **March 2024**

- Developed a custom shell (akin to Bash/ZSH) utilizing Lex/Yacc; implemented advanced features including parent-child process management, custom piping for stdin/stdout/stderr, signal handling, command history, loops (if/while/for), environment variables, and wildcard expansion.
- Achieved zero memory leaks using Valgrind for debugging and optimization.

Wave | *Python, Next.js, Tailwind.css* **Jan 2024**

- Enabling touchless interactions with a computer using user-trained hand gestures with only a webcam.
- Engineered a highly efficient sequence matching algorithm resilient to noise, scaling to thousands of gestures with sub-100ms latency for triggering actions.

Soundscape | *Python, React, Expo, Flask, Google Cloud* | **https://github.com/dwijenchawra/soundscape** **Jan 2023**

- Developed an intelligent playlist generator leveraging NLP and sentiment analysis on transcribed speech.
- Utilized CockroachDB for storing vectorized song data, dynamically generating playlists based on user emotional context.
- Awarded "Best use of CockroachDB" at Purdue's annual Boilermake X hackathon.

Selected Publications

A threshold by any other name: is five minutes of wake 'long' enough to degrade sleep quality? **Nov 2023**

Oxford Sleep — https://doi.org/10.1093/sleep/zsad295

The Impact of Missing Data and Imputation Methods on the Analysis of 24-Hour Activity Patterns **Sep 2022**

Clocks & Sleep — https://doi.org/10.3390/clockssleep4040039

Objective underpinnings of self-reported sleep quality in middle-aged and older adults: The importance of N2 and wakefulness **April 2022**

Biological Psychology Volume 170 — https://doi.org/10.1016/j.biopsycho.2022.108290

Technical Skills

Languages: Python, C, C++, Java, x86 Assembly, R, Julia, HTML, CSS

Developer Tools: Linux, OpenCV, AWS, PyTorch, Scikit-learn, Numpy, Pandas, Docker, Kubernetes, LLMs, Flask

Concepts: Data Pipelining, Statistical Analysis, High Frequency Signal Processing, Machine Learning, Deep Learning, High Performance Computing, Distributed Systems, Computer Vision, NLP, Data Analysis, Git, Agile, DevOps