

Harshvardhan Shinde

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EDUCATION

University at Buffalo

Buffalo, NY

Honors B.S./M.S. in Computer Science with a Minor in Mathematics; GPA: 3.83

Present

TECHNICAL SKILLS

Languages: C++, SQL, OCaml, C, JavaScript, HTML/CSS, Python, Java

Frameworks / Libraries: Hadoop, Spark, TacoDB, Pytorch, Pyautogui, Mediapipe, React, OpenCV, Tailwind, Flask, Java Swing

Tools / Technologies: Gemini, Claude, Emacs, Git, Unity Game Engine

Natural Languages: Japanese, French, English, Hindi, Marathi

EXPERIENCES

Software Engineering Lab Intern

June 2026 – Present

University at Buffalo

Amherst, NY

- Co-architecting Phase 1 of a multimodal passive sensing platform designed to characterize tinnitus behavioral subtyping by integrating active and passive data streams across consumer-grade ecosystems (Fitbit API, iOS/Android).
- Developing data ingestion pipelines to synchronize high-frequency passive sensing modalities (HRV, EDA, sleep quality, physical activity, and ambient sound levels) with smartphone-based Ecological Momentary Assessment (EMA) triggers.
- Designing telemetry and user engagement features to mitigate the industry-standard 89% EMA non-adherence rate, ensuring robust data density required for downstream longitudinal predictive modeling.
- Implementing data preprocessing and statistical clustering pipelines to analyze multi-device streams, translating physiological and environmental ground truths into distinct clinical and behavioral phenotypes.

Teaching Assistant CSE-305

August 2025 – Present

University at Buffalo

Amherst, NY

- Improved student comprehension and assignment completion rates for 600+ students by leading weekly recitations and office hours focused on functional programming concepts in OCaml.
- Reduced student debugging time by guiding structured problem-solving approaches and functional design patterns across assignments and exams.
- Collaborated with instructors in weekly meetings to improve course delivery and students outcomes and maintained grading consistency and academic integrity across 600+ students by evaluating exams and projects using standardized rubrics.

AI Research/Development

April 2025 – December 2025

University at Buffalo

Amherst, NY

- Contributing as a co-author and developer on a soon-to-be-published Medical Spanish conversation app, ensuring accurate medical language usage and AI alignment with healthcare needs.
- Collaborating within an interdisciplinary team including linguistics and pre-med researchers to align AI outputs with real-world medical communication needs
- Designing and implementing natural language processing (NLP) pipelines to parse and analyze Spanish medical vocabulary and sentence structures

PROJECTS

WiFi CSI Fitness Assessment System | *ESP32-S3, PyTorch, DSP, Python*

February 2026 – May 2026

- Built a device-free wireless sensing system using a transmitter-receiver pair of ESP32-S3 microcontrollers to assess bicep curl form quality by capturing raw Channel State Information (CSI) across 192 subcarriers.
- Engineered a multi-stage DSP pipeline incorporating static multipath subtraction, a 4th-order Butterworth bandpass filter, and PCA to isolate dynamic human motion features from environmental noise.
- Designed a novel 95% Cumulative Energy Envelope extraction method from STFT spectrograms to stably capture continuous velocity changes and Doppler frequency shifts caused by physical movement.
- Trained a feed-forward PyTorch neural network mapping frequency and energy features to a continuous form-quality score, achieving 83% prediction accuracy within a 15% error margin across varying ranges of motion.
- Translated quantitative model outputs into an automated coaching framework, providing real-time qualitative feedback tiers on exercise tempo consistency and range-of-motion execution.

S&P 500 End-to-End Big Data Pipeline | *Python, Hadoop HDFS, Spark, Docker*

March 2026 – May 2026

- Engineered an end-to-end big data processing pipeline using Dockerized Hadoop HDFS and Apache Spark to ingest, clean, and analyze historical daily OHLCV stock market data across 505 component stocks.
- Designed and configured a standalone HDFS cluster via Docker container execution, establishing robust raw and cleaned data directories to support distributed data storage for over 497k transactional rows.

- Implemented an automated data cleansing workflow performing 6 distinct structural transformation operations using Pandas and NumPy to address missing values, schema validation, and outlier detection.
- Conducted comprehensive Exploratory Data Analysis (EDA) using Matplotlib and Seaborn, mapping asset performance objectives and macro stock market trends over a multi-year timeline (2014–2017).
- Developed scalable analytical models utilizing Spark ML, applying 3 distributed machine learning algorithms to meet core stock trend predictive modeling and statistical regression tasks.

Air Board | *Python, Mediapipe, Pyautogui, Microsoft OCR, cv2, pyqt5*

November 2025

- Developed a gesture-based control system using MediaPipe and PyQt5 that enables hands-free computer interaction through real-time hand tracking.
- Implemented multiple operational modes including drawing with OCR text conversion, mouse cursor control, and Windows shortcut gestures for enhanced accessibility.
- Engineered robust gesture recognition algorithms for pinch detection, finger counting, and specific hand poses to trigger system commands and application controls.

Gambling Addicts | *Full Stack Development*

Feb 2025 – May 2025

- Developed a virtual casino platform to simulate popular games such as Poker, Blackjack, and Roulette to provide a realistic and personalized casino experience.
- Utilized Agile methodology with four development sprints, leveraging user stories and task cards to coordinate effectively within a team of five developers.
- Engineered a secure full-stack web application using MySQL, HTML/CSS, JavaScript, and PHP, incorporating password hashing, protection against njection attacks, and session validation to safeguard data, with customizable profiles and seamless gameplay.

AWARDS / RECOGNITIONS

UB Hackathon | *1st Place Finish*

November 2023

- Official University at Buffalo 24-hour hackathon to create inspiring new projects in small teams up to 4 people sponsored by Major League Hacking
- Over 500+ competitors and 100+ projects.