Harrison Martin

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Education

Stony Brook University | GPA: 3.62 — Stony Brook, NY, USA
B.E. in Biomedical Engineering — Sept 2024 - May 2028 (Expected Graduation)
B.S. in Data Science (Double Major)

Relevant Coursework: Data Structures, BME Programming Fundamentals, Applied Linear Algebra, Survey of Probability of Statistics, Calculus I, II, III, IV, Emergent Biodesign, Molecular and Cellular Biology

Experience

Simmerling Lab *(Quantitative Biology Lab at Stony Brook University)* — Stony Brook, NY, USA
Research Assistant — Oct 2024 – Present

- Analyzed molecular dynamics simulations of protein folding using Python, CPPTRAJ, and VMD to extract structural and temporal features
- Applied clustering techniques to identify representative conformations and compared simulated structures to experimental NMR/X-ray data
- Synthesized multi-dimensional data from molecular dynamics simulations, experimental NMR, and X-ray crystallography to generate comprehensive insights into protein structural dynamics and conformational states, focusing on amyloid-beta 42 peptide folding and aggregation mechanisms.

Projects

AI-Assisted Orthographic Design Analysis (*in progress)*
w/ Dr. Yin, BME Dept. Stony Brook University — Oct 2025 – Present

- Compared student-created and AI-generated orthographic AutoCAD designs using large language models (LLMs), analyzing workflow and accuracy differences
- Assessed the value of traditional AutoCAD education versus AI-driven design workflows for engineering education
- Developed prompts to refine LLM outputs for consistently high-quality technical drawings

AccessLens — Full-Stack AR Accessibility Platform
Stony Brook University, at SBCS Hackathon — Nov 2025

- Developed real-time AR accessibility features, including face recognition, scene description, and gesture controls, utilizing MediaPipe, TensorFlow.js, and Firebase, achieving sub-100ms latency.
- Architected and optimized Firebase backend for multi-user face data and AI-generated conversation summaries with GPT-3.5, enabling scalable, persistent memory and seamless updates.
- Engineered browser-based ML pipelines with MediaPipe Hands and face-api.js for gesture and face recognition, ensuring cross-browser compatibility and robust performance in real-time.

Breast Tumor Classification using Deep Learning
Kaggle BreakHis Dataset — Aug 2025

- Built an end-to-end breast cancer histology classification platform using TensorFlow (MobileNetV2) and FastAPI, deployed with a React frontend for image-based predictions.
- Developed a custom training pipeline with focal loss, data augmentation, and class weighting; optimized performance via transfer learning, early stopping, and fine-tuning.
- Achieved 93% validation accuracy and F1 score of 0.95 on malignant samples, with performance visualized and analyzed using Matplotlib and Scikit-learn.

Technological Skills

Python (TensorFlow, Keras, scikit-learn, pandas), Java, Bash, SQL, Git, Arduino, Excel
Machine Learning, Deep Learning, Bioinformatics (RNA-Seq, MD Simulations), FastAPI, React
Model Training & Evaluation, Image Classification, EDA, REST APIs, Cloud Deployment
3D Modeling AutoCAD

Relevant Information

- Activities: *Biomedical Engineering Society,* ***Community Organizer*** *for Stony Brook Climbing Club*