Tony Enrique Astuhuaman Davila

ta787s@missouristate.edu | tonyastuhuaman.com | github.com/trobutlef

EDUCATION

Missouri State University   August 2024 - May 2026 (expected)
MNAS in Material Science & Computer Science
Research Interest: Drug Design & Artificial Intelligence

Missouri State University   Graduated: May 2024
B.S. in the Honors College with distinction in Computer Science and minor in Mathematics (Magna Cum Laude)
Research areas: Bioinformatics, Computer Vision & Artificial Intelligence

Stanford University, Stanford Center for Professional Development   June 2023 - August 2023
Enrolled in **CS221** (AI principles and techniques) as a non-degree student through the Tuition Waiver Program

Universidad de Ingeniería y Tecnología (Peru)   March 2020 - August 2021
Studied towards a B.S. in Computer Science (Transferred to Missouri State University before completion)

AWARDS AND HONORS

Best Paper Award, IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology	2024
Graduate Research Assistant at PAMS Department, Full Tuition Waiver	2024
1st Place in Computer Science category - Missouri State CNAS Undergraduate Symposium	2024
Member of Kappa Mu Epsilon, Mathematics Honor Society	2023, 2024
Bloomberg Accelerator Summer School Fellow	2023
ICPC Mid-Central Representation for Missouri State University	2023, 2024
Top 3 in the Best Accessibility Hack, HackHarvard	2022
International Transfer Scholarship at Missouri State University	2021 - 2024

PROFESSIONAL EXPERIENCE

PAMS Department (Missouri State University)   Springfield, MO
Graduate Assistant under Dr. Ridwan Sakidja   August 2024 - Present

- Conducting research on structure-based drug design using equivariant diffusion models for optimizing and creating new drugs.
- Assisting in and grading physics labs by helping students grasp concepts and improve their academic performance.

Computational Learning Systems Lab (Missouri State University)   Springfield, MO
Bioinformatics Research Assistant under Dr. Tayo Obafemi-Ajayi   January 2024 - July 2024

- Engaged in cutting-edge bioinformatics research on mTBI, focusing on the analysis of blood biomarker trajectories using numpy and matplotlib for data visualization and statistical analysis.
- Developed and implemented cutting-edge clustering algorithms to categorize mTBI cases, enhancing the precision of clinical prediction tools through the application of machine learning models, including autoencoders.
- Contributed to the lab's research output by analyzing and presenting findings on data-driven techniques, significantly advancing the understanding of biomarker patterns in mTBI diagnosis and treatment.
- Won 1st place by presenting research findings on Explainable AI outcomes from neurogenetic diseases at CNAS Spring Symposium 2024.

Security and Artificial Intelligence Lab (Missouri State University)   Springfield, MO
Undergraduate Research Assistant under Dr. Yassine Belkhouche   August 2022 - May 2024

- Developed virtual classroom engagement through 3D face reconstruction from 2D imagery using the FLAME model and PyTorch, culminating in lifelike virtual presence and interactions with Unity.
- Designed a real-time hand gesture recognition system for UAV navigation using Google's MediaPipe and TensorFlow, significantly enhancing user interaction and drone control efficiency.
- Presented research findings on UAV gesture control at the CNAS Spring Symposium 2023, emphasizing the model's high accuracy and real-time performance.

Association for Business Information Technology Students (A-BITS)   Springfield, MO
Back End Developer   May 2022 - August 2022

- Developed REST APIs for payment processing with an emphasis on secure, scalable code.
- Integrated Stripe API, contributing to a 15% decrease in bugs per release cycle through rigorous unit testing.
- Practiced Agile development methods and continuous integration to support rapid feature deployment.

TEACHING AND MENTORING

Mathematics Tutor at BearClaw (Missouri State University)   Fall 2023; Spring 2024

- Funded through the **ELATE: Enhanced Learning and Training Experiences Grant** from the College of Natural and Applied Sciences, which supports my role as a Mathematics Tutor, enabling focused and effective learning experiences for students.
- Provided personalized tutoring sessions to students in various mathematics courses, helping them grasp complex concepts and improve academic performance.

Competitive Programming Mentor (ACM Chapter at Missouri State University)   Fall 2023

- Developed comprehensive training programs focused on algorithm design, problem-solving techniques, and contest strategies, leading to increased skill levels and competitive success among team members.

Computer Science Tutor (Missouri State University)   Spring & Fall 2022; Spring & Fall 2023

- Improved students' grades across all undergraduate courses in Computer Science by an average of 20%, as measured by their academic performance, through the delivery of individualized and group tutoring sessions.
- Raised student enrollment and engagement as measured by increased student numbers, by providing resources and professional guidance.

PROJECTS

SpeakEazy
Project Link: https://github.com/Hrithikpb/speakEazy   June 2024

- Developed website with Hume API for real-time sentiment analysis to evaluate public speaking features in user.
- Engineered body language model analysis for an improved analysis of delivery of a message using Google Mediapipe.

Centroids
Project Link: https://github.com/clslabMSU/centroids   May 2024

- Developed dimensionality reduction (DR) algorithms such as PCA, T-sne and UMAP to evaluate neurogenetic datasets.
- Optimize ranking system using feature importance algorithms for better explainable graphs.
- Deployed it as open source code in GitHub as well as publication in IEEE CIBCB journal.

MePart
Project Link: https://github.com/trobutlef/CalHacks23-OpenAI   June 2023

- Developed "Video Analysis with OpenAI" application to revolutionize video interaction by automatically generating accurate transcripts, extracting insights, conducting sentiment analysis, and categorizing content.
- Leveraged GPT-3.5 turbo model from OpenAI and developed a backend using FastAPI, connected with a frontend built with React.
- Successfully built in just 36 hours during the prestigious **UC Berkeley AI Hackathon**, a notable achievement as only 1,200 students were selected from 2,000 applicants, making video and lecture content more accessible and searchable.

Sticky Sign
Project Link: https://github.com/trobutlef/Sticky-Sign   October 2022

- Developed an augmented reality tool to facilitate American Sign Language (ASL) learning, employing Python, OpenCV, and Pygame for real-time color detection and sign recognition.
- Created a user-friendly interface that allows users to interact with the system through webcam input, making the learning process interactive and engaging.

Chess AI
Project Link: https://github.com/trobutlef/Chess-AI   November 2022

- Developed a Flask-integrated website, enabling user interaction with a Chess AI model built using a TensorFlow-based CNN, which was successfully deployed on Vercel.
- Implemented the Alpha Beta Pruning algorithm, optimizing the decision-making process and significantly improving the AI's gameplay performance.

LEADERSHIP EXPERIENCE

Founder & President of the Computer Science Club/ACM Student Chapter   Missouri State University, 2022

- Led a team of 10 officers in organizing events, workshops, and coding competitions, fostering an active tech community on campus.
- Collaborated with industry professionals and professors to conduct informational sessions and guest lectures, providing students with insights into current trends and technologies in the field.

VOLUNTEERING EXPERIENCE

HarvardXR 2023 Inaugural Conference   Cambridge, MA
Volunteer Staff Member & Online Communication Coordinator   March 2023 - April 2023

- Assisted in the first-ever conference at Harvard focusing on emerging technologies like AR/VR/MR and the Metaverse, featuring recognized speakers in the field.
- Collaborated with a diverse team to facilitate various aspects of the conference, from technical setup to Q&A sessions.
- Managed online communication through Discord, ensuring smooth interaction among participants, speakers, and organizers.

Pummill Math Relays (Department of Mathematics at Missouri State University)   Springfield, MO
Exam Proctor   April 2023

- Served as a proctor for the Pummill Math Relays, a longstanding annual event that hosts high school students for a series of math competitions.
- Assisted in various sections including Calculus, Algebra, Geometry, and Math Mania, ensuring fair and smooth conduct of the competitions.

CONFERENCE PRESENTATIONS

Poster Presentations

- Astuhuaman Davila, T., Belkhouche, Y. (2023, April). Real-Time Hand Gesture Recognition for Drone Control Using Deep Learning. 2023 CNAS Undergraduate Research Symposium, Springfield, Missouri.
- Astuhuaman Davila, T., Obafemi-Ajayi, T. , Hier, D. (2024, April). Increasing Explainability Of Dimension Reduction Methods For Machine Learning Outcomes. 2024 CNAS Undergraduate Research Symposium, Springfield, Missouri. (1st Place)

Paper Publication

- Astuhuaman Davila, T., Obafemi-Ajayi, T. , Hier, D. (2024, June). Towards Explainability Of Dimension Reduction Methods For Machine Learning Outcomes. IEEE CIBCB 2024, Natal, Brazil. (Best Paper Award)

TECHNICAL SKILLS

- **Relevant Coursework:** Principles of Artificial Intelligence, Data Structures and Algorithms, Operating Systems, Database Systems, Computer Architecture, Software Engineering, Computer Networks, Statistics, Multivariable Calculus, Discrete Mathematics, Physics
- **Programming:** Python, C++, C, JavaScript, Typescript, Java, SQL, HTML, CSS, Swift, Kotlin
- **Technologies:** Tensorflow, Pytorch, Keras, scikit-learn, pandas, OpenCV, Android, Flask, FastAPI, Git, ReactJs
- **Languages:** Spanish, English