ERIC XU

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OBJECTIVES

An internship or research opportunity that will allow me to utilize my problem solving skills and attention to detail to further develop my abilities in the field of computer science.

EDUCATION

- **University of Maryland College Park** Computer Science (3.94/4.0) 2023-2027
- **Marriotts Ridge High School** 3.92/4.0 2019-2023

SKILLS

Programming Languages:	Python	Java	C Sharp
Artificial Intelligence:	Machine Learning	PyTorch	TensorFlow
Developer Environments:	Visual Studio	Git	Linux
Web Development:	React	Flask	
Database:	PostgreSQL	MySQL	

WORK EXPERIENCE

AI for Thumbnails Text Recognition 2023-Present

- ***Project:*** Working with a professor at University of Baltimore on a research project to enhance the text recognition capabilities of Google's Gemini AI within thumbnails for cybercrime investigations. GitHub https://shorturl.at/vBO19
- ***Responsibilities:*** Designed and implemented the text recognition process utilizing the Gemini API to assess two primary objectives: (1) evaluating Gemini's capability to recognize text in thumbnails and (2) examining whether fine-tuning Gemini surpasses the performance of zero-shot results. The findings indicate that (1) Gemini effectively recognizes text in thumbnails when the sizes of thumbnails are medium and large, and (2) fine-tuning the model with few-shot learning enhances text recognition accuracy, demonstrating an improvement from 10% to 20%, even in scenarios where human recognition of the text is challenging. Results were graphed using Matplotlib and Seaborn.

Election Judge 2022

- ***Responsibilities:*** Ensuring fair and orderly elections by verifying voter eligibility, assisting voters, overseeing polling place operations, and accurately reporting results.

PROJECTS

University Of Maryland: Terps Racing - Data Visualization 2023-Present

- ***Project:*** Get readings from sensors on the racing car, store them in a database, and allow the Baja racing team at UMD to see data updates live through a website in order to pinpoint what to improve for better competition performance. GitHub https://shorturl.at/fwN45

- ***Responsibilities:*** Wrote programs to (1) read sensor data from an Arduino using libraries such as pySerial, (2) send the push the read data into a PostgresSQL database using psycopg2, (3) set up a Flask backend to read from the database, and (4) create a front end locally hosted website using React to visualize data with Matplotlib.

University Of Maryland: Robotics at Maryland 2023-Present

- ***Project:*** The group is split into teams to create a submarine robot to teach members about the development process and eventually participate to compete in competition. Gitlab https://shorturl.at/ftRU4
- ***Responsibilities:*** (1) Using the Simple and Fast Multimedia Library in C++ for processing joystick input, (2) interfacing with a Raspberry Pi to communicate with the robot, (3) developing C++ controls for the submarine robot, and (4) utilizing PostgresSQL to save inputs and sensor readings are integral steps aimed at improving competition performance.

Godot Video Game 2023-Present

- ***Developed*** an open source project to replicate the physics in Valve's Source engine inside Godot4's game development program. Using this project to build a game and create assets with Blender, GameMaker, and Material Maker. Github https://shorturl.at/oDUZ5

Graphical Relationship Analysis from Visual Data 2022-2023

- ***Project:*** Working with a Towson University professor, the goal is to automatically identify objects in a picture and the relationships between them. GitHub https://shorturl.at/ejnpW
- ***Responsibilities:*** (1) Researched machine and learning Graph Neural Networks, (2) made a Long short-term memory Neural Network using Pytorch, (3) trained on data sets from Kaggle, (4) compared the accuracy of GNN and LTSM, (5) and wrote a report on the results and research process.

First Tech Challenge September 2019 - 2022

- ***Led*** a team "Big Brain Bots" to design and implement a large robot for the 2022 FIRST Tech Challenge (FTC) competition. Also led the programming team. Worked on Autonomous and Teleop programming.
- ***Won*** the second place of Think Award in Maryland state-level competition and Howard County STEM Award. The robot was designed in Fusion 360 software and the implementation of the robot control system was written in Java.

NSA Minecraft August 2021

- ***Selected*** to participate one-week summer Cybersecurity camp organized by the Department of Computer Science at the University of Missouri-Kansas City and funded by the National Security Agency (NSA) GenCyber Program.
- ***Worked*** on interacting with Minecraft's world edit API to build a project educating players on cybersecurity. Won an Honorable mention prize.

PUBLICATIONS

Research Publication

- Eric Xu, Alex S. Xu, Danny Ferreira, and Lin Deng. "A Hands-on Digital Forensic Lab to Investigate Morris Worm Attack." In Proceedings of the 54th ACM Technical Symposium on Computer Science Education V. 2, pp. 1283-1283. 2022.

Journal Publication

- "Learning in the Competition" in Maryland Voices Volume XII, 2022. Maryland Voices is the only Maryland-based student-run journal, publishing the best creative nonfiction pieces of Maryland high school students once a year (https://marylandvoices.home.blog/).