NATHAN SAMSON

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EDUCATION

University of Maryland - Baltimore County **August 2023 - May 2027**
Bachelor's, Computer Science *GPA: 3.5*

PROFESSIONAL EXPERIENCE

University of Maryland - Baltimore County **Baltimore, MD, USA**
Undergrad researcher *September 2023 - Present*

- Developed algorithms that analyze noise, sound, and light levels, contributing to back end data processing efficiency and strengthening insights into occupancy detection and environmental conditions by utilizing data structures.
- Optimized data retrieval processes by developing SQL and InfluxDB databases that prioritize organization and leverage cloud computing technologies for enhanced data management.
- Integrated MQTT and EMQX for real-time data communication, improving data flow from sensors to databases
- Designed and implemented RESTful APIs to facilitate communication between the TSDBMS and the application layer.
- Employed the SARIMA algorithm which utilizes statistics and machine learning to forecast trends in sensor data, strengthening the lab's research efforts in IoT applications.
- Boosted server processing capabilities for real-time data from IoT sensors through the integration of edge computing and cloud computing, ensuring effective database management.
- Working on a research paper in partnership with a professor and a PhD student in the application of IoT technologies and data insights.

OmniSyncAI **Remote**
Full stack Software Engineer intern *May 2024 - July 2024*

- Designed and developed a user-friendly account setup process for a customer relationship management (CRM) platform using Node.js, React, and PostgreSQL, facilitating seamless onboarding by allowing businesses to invite team members and utilize AI recommendations.

PROJECTS & OUTSIDE EXPERIENCE

Advanced Connect4 AI with Reinforcement Learning

- I developed an AI for playing Connect4 using advanced reinforcement learning techniques, including Distributional Dueling Networks, Noisy Nets, and Prioritized Experience Replay, all with PyTorch
- Integrated into a custom game environment and connected to a real-time interface via a Flask API
- Optimized for CUDA-enabled GPUs, with performance metrics monitored using TensorBoard
- Implemented opponent modeling to enhance adaptability, significantly improving performance against various strategies and players.

SMART campus

- Initiated a Smart Campus project aimed at real-time space availability using advanced IoT technology while ensuring privacy with LiDAR sensors, and created a user-friendly interface that assists students in navigating crowded locations.
- Enabled user engagement by creating a front-end interface that allows students to monitor real-time occupancy of fast food locations and eventually potential future time occupancy (Has not been made public will have to get approval from UMBC)

YouTube Comments Extraction and Sentiment Analysis Project

- I created a Python-based project leveraging the YouTube Data API to gather video comments for sentiment analysis
- Utilized advanced NLP techniques and machine learning models with TensorFlow and scikit-learn, enhanced by prompt engineering with the LLaMA Index
- Provided content creators with insights into viewer reactions through an intuitively designed interface, aiding in strategic optimization of digital content

SKILLS

Skills: Data Science, Flask, HTML/CSS, Java, REST APIs, Tensorflow, Python, MATLAB, OpenCV, Data Analysis, SQL, Algorithms, AI, Machine learning, IoT, Data management, Prompt-engineering, Natural Language Processing (NLP), C/C++, JavaScript, Edge Computing, Linux, MQTT