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EDUCATION

**Duke University** Durham, NC

*Master of Engineering, Artificial Intelligence, Cumulative GPA 4.0/4.0 Aug 2024 – Dec 2025*

Coursework: Modeling Process & Algorithms, Explainable AI, Deep Learning, Sourcing Data for Analytics, Large Language Models

Teaching Assistant: Explainable AI (Spring 2025)

**University of Rochester** Rochester, NY

*Bachelor of Science, Computer Science, Cumulative GPA 3.62/4.0 Graduated: May 2022*

Minors: Mathematics, Audio Music Engineering; Certifications: AWS Cloud Practitioner

Coursework: Artificial Intelligence, Design & Analysis of Efficient Algorithms, Data Mining, Database Systems

WORK EXPERIENCE

**Applied ML Researcher** | Duke CREATE Lab Durham, NC

*Technologies Used: TensorFlow, React, Flask, Git, OpenAI APIs, DeepSeek Nov 2024 – Present*

* Leading the development of a machine learning-based platform for personalized student learning, leveraging LLMs to generate dynamic quizzes from lecture materials; Conducting research into LLM evaluation to ensure the responses and feedback’s quality
* Implementing real-time NLP workflows to process uploaded content and extract key concepts for assessment generation, with plans to optimize model efficiency for edge deployment
* Designing scalable backend architecture and integrating ML pipelines for NLP tasks, ensuring real-time, low-latency performance

**Lead Developer** | Freelance Tunis, Tunisia

*Technologies Used: React Native, Figma, TestFlight, Expo, Git, Swift, Oct 2023 – Aug 2024*

* Led a team of 4 to develop a mobile app for Tunisia’s leading radio company, achieving 100,000+ downloads and enhancing user engagement through features like live radio streaming and account management
* Directed the design phase on Figma, managed client communications and iterative feedback, and ensured successful app deployment on TestFlight, driving continuous improvements in UI/UX and functionality
* Spearheaded API integrations for online radio and live video streaming, coordinating with the client to modify and create API endpoints, resulting in enhanced functionality and ensuring scalability and adaptability to evolving client requirements

**Software Engineer** | Wetware Biosystems Remote

*Technologies Used: React, Node.js, Express, MongoDB, Mongoose, Git, HTML, CSS Jan 2023 – Jul 2023*

* Spearheaded the development of a full-stack web application from scratch using the MERN stack, enabling the company to efficiently manage their manufactured devices, contributing 100% of the code
* Designed and implemented RESTful APIs for secure data storage and retrieval from MongoDB
* Optimized data models and workflows, improving system efficiency and security for client operations, using robust authentication and hashing with bcrypt and JWT. Leveraged Redux for seamless state management

**Junior Software Engineer** **|** JD Software Salem, Massachusetts

*Technologies used: Angular, Postgres, TypeScript, JavaScript, Next.js, C#, MySQL, Java Aug 2022 – Jan 2023*

* Designed and implemented an upload feature in an ASP .NET App to streamline user information updates across multiple SQL tables from an Excel sheet, saving stakeholders 2 hours per week and improving workflow efficiency
* Digitized metadata for Massachusetts Controlled Substances Registrations, enabling online applications for health professionals. Ensured compliance with regulations in data storage and sensitive information handling
* Collaborated with Department of Health officials to gather project requirements and translated them into SQL operations, ensuring accurate implementation of licenses in accordance with CFR regulations

RESEARCH & PROJECTS

* **MIRAGE**: Conducting independent research under Duke faculty supervision to generate imperceptible audio perturbations that protect artists’ vocal tracks from unauthorized scraping and AI mimicry. Achieved proof-of-concept by poisoning state-of-the-art models like RVC, and currently developing a custom architecture to generalize protection across music generation models
* **MusicTranscribe**: In a team of 3, developed a mobile app in 36 hours that converts hummed melodies or recorded melodies from instruments into playable MIDI files, enabling real-time music ideation for artists. Built with React Native, Flask, and Spotify’s Basic Pitch for audio analysis, achieving a proof of concept with selectable instrument output. Integrated prompt-based music generation capabilities using Meta’s MusicGen model for enhanced customization
* **AI Explainability Techniques***:* Developed a series notebooks demonstrating interpretability techniques across AI models, including embedding visualizations for political speech patterns with t-SNE and UMAP, saliency maps for ResNet50 bias analysis, global feature importance with ICE, PDP, and ALE on XGBoost on different datasets. Applied LIME for local explanations of ResNet34 predictions, highlighting model decision-making processes