# Jinda Zhang

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## SKILLS

Python(TensorFlow, PyTorch), Java, C++(OpenCV), R, **JavaScript, TypeScript, Node.js, Express.js, React, React Native, Redux.js, MongoDB, SQL, Android, Google Cloud Platform(GCP), AWS, Git, Unix, Docker**, Accessibility, Testing, Data Visualization, Data Analysis, Data Mining, Deep Learning, Computer Vision, Speech Processing, Natural Language Processing

## EXPERIENCE

**Machine Learning Intern,** HCI Lab at Khoury **SP24**

- Conducted research on integrating large language models for AI avatars in virtual reality, under the guidance of Profs. Yvonne Coady, Mirjana Prpa, and Dakuo Wang.
- Designed a memory system in MongoDB, enabling the AI avatar to store interactions, and improved user interaction through voice detection, auto-correct models, and expressive behaviors in virtual environments.
- Developed algorithms for memory retrieval and utilized prompt engineering to create realistic, context-aware AI avatar responses, integrating CV, OCR, and Deepgram APIs for enhanced functionality.

**Machine Learning Intern - HappyPrime Inc, Manager: Prof. Aanchan Mohan** **FA23 - Now**

- Conducted research on Unified-Modal Speech-Text Pre-Training Models (e.g., SpeechT5, Wave2Vec2) and developed robust Speech Recognition and Voice Conversion tools using Flask, React.js, Docker, and Minio, promoting accessibility for users with atypical speech patterns.
- Designed and implemented error correction algorithms using BART LLM, G2P frameworks, and finetuned Wav2Vec for transcribing atypical speech, integrating a phoneme n-gram language model with CTCDecoder for improved accuracy in ASR systems.
- Researched and designed a novel multimodal large language model architecture for augmentative communication, integrating phoneme information into existing Speech LLMs to support individuals with impaired speech, leveraging Linux HPC for model training and automation.

**Machine Learning Intern,** Khouy College of CS **SP24**

- Integrated Remotely Piloted Aircraft Systems (RPAS) and Computer Vision (CV) to manage Canada's natural resources, focusing on forests by designing and implementing a sliding window technique to process large georeferenced maps.
- Applied YOLO object detection models for tree type identification, achieving precision and recall scores of 0.904 and 0.848, and used SORT model variations like YOLOv8, DETR, and EfficientNet to enhance detection accuracy.
- Developed color-coded maps highlighting fire risks based on tree detection results, aiding fire managers in assessing and strategizing for fire prevention.

**Freelance Software Engineer - UDEVU** **SU22**

- Designed and developed engaging and user-friendly **3D** web applications using **Three.JS** - **Client**: Josh Struve (Udevu.dev)
- Ensured web pages were accessible and complied with **A11y** accessibility standards
- Provided consultative support on **search engine optimization**, ensuring the organization's web presence was optimized

**Software Engineer Intern - RoarPanda** **SP22**

- Developed and implemented research tools and algorithms in **Python** to download 30,000 malware software gene samples
- Utilized **Python** and **Django** to analyze and display results of malware software genes and collaborated with the research team to test and debug antivirus software modules for improved user experience.
- Collaborating closely with developers on improving model forecasting performance and reaching a 96% prediction accuracy.

**Research Intern** - Lapis Lab, University of Illinois Urbana-Champaign FA24 - Now

- Academic research group based out of the University of Illinois Urbana-Champaign, created to help promote research in the field of machine learning and artificial intelligence amongst the wider academic student body

**Mentor, Research Capstone** FA24

- **Lead** 3 teams speech and language researchers, worked as a project lead conducted weekly research check-in meeting

**Lead Teaching Assistant, Research Capstone** SU24

- **Lead** a team of 40 student researchers and **9 ML research groups**, worked as a project lead, conducted weekly research check-in meeting, research paper revisement, and provide weekly **research agenda** and feedbacks for all research groups

## EDUCATION

**Master in Computing**, Northeastern University, Canada SP23 - Now

**Master in Statistics**, University of Glasgow, UK 22

**Bachelor in Math**, Indiana University Bloomington, USA 20

## PROJECTS

**AI Dreamer (Web App)**

- Developed a full-stack web application for AI, ML enthusiasts to find projects using **Javascript**, **React, Node.js and Express**, implementing features such as user authentication with **Auth0**, dynamic rendering, and integration with external **API**.
- Utilized **Prisma** ORM to interact with a **MySQL** database, designing database tables to store user information and interactions
- Implemented responsive design principles to ensure the application's usability on cross-platform devices, conducting accessibility testing using **Google Lighthouse** and including **accessibility** reports, including **Jest Testing** Framework

**ML:** Half-UNet(Paper Reproduce), ForestSeg(VIsion, Segmentation), VideoEffects(C++), Summarizer(NLP), VoiceCollector(Flask, React, NLP), Diagnosing Bias in Facial Detection Systems (Vision, Autoencoder), Music Generation using Character RNN(LSTM)
**Software:** Financial Analyzer(NLP, OCR) AI-Dreamer(React,NodeJS), Firelook(Android), Around(GoLang,ElasticSearch), Ticket(Java, EC2, MySQL), Titan(MapReduce, MongoDB), Shiny-Instagram(Java), Sparking-Memos(Java), HairSalon(JS)

## SELECTED PUBLICATIONS

"ELLMA: LLM-Powered Conversational AI Chat Agents in VRChat with Social Intelligence" (In Submission) Paper
"Building LLM-based AI Agents in Social Virtual Reality" (CHI LBW '24) Paper Demo
Meaningful system-development using the TORGO dataset for dysarthric ASR (Submitted '24) Paper
Enhancing Tree Type Detection in Forest Fire Risk Assessment: Multi-Stage Approach and Colour Encoding with Forest Fire Risk Evaluation Framework for UAV Imagery Arxiv
Error-correction methods for correction of text transcriptions derived from atypical speech (Submitted '24)