

Ethan Xu

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EDUCATION

North Carolina State University

Bachelor of Computer Science (GPA: 3.3)

Relevant Coursework: Discrete Mathematics, Data Structures and Algorithms, Automated Learning and Data Analysis

Raleigh, NC

Aug. 2024 – May 2027

Virginia Tech

Biomedical Engineering (Transferred) (GPA: 3.6)

Blacksburg, VA

Aug. 2023 – May 2024

SKILLS

Languages: Java, Python, TypeScript, C, SQL, R

Tools/Frameworks: Flask, React, Node.js, Git, Pipecat, MediaPipe

Infrastructure: Linux (Apache/Gunicorn), Google Cloud Platform

EXPERIENCE

Voice AI Research

Undergraduate Researcher

Raleigh, NC

Sep. 2025 – Present

- Designing a comparative benchmarking framework to identify tradeoffs between different Voice AI Solutions.
- Architecting a multimodal agent using Pipecat to orchestrate Deepgram (STT), OpenAI (LLM), and Gemini (TTS).
- Implementing the Perspective-n-Point (PnP) algorithm to map 468 MediaPipe facial landmarks to servo angles, utilizing One Euro Filters to minimize signal jitter.
- Developing conflict resolution logic where the agent identifies ambiguous instructions and requests user clarification.
- Prototyping a Vite + React + TypeScript simulation environment to visualize robotic head movements and debug instruction before deployment.

Southpoint Dentistry

Software Engineer / Lab Technician

Durham, NC

June 2022 – Present

- Designed and deployed a full-stack implant inventory management system using Flask and SQLite
- Eliminated treatment delays by digitizing a manual, photo-based tracking system.
- Integrated automated stock shortage alerts in order to ensure inventory is kept in stock.
- Configured and managed deployment on a Google Cloud instance using Apache and Gunicorn.
- Designed 3D surgical guides and leveraged technical experience to troubleshoot and maintain digital dentistry equipment.

Vitang Technologies

Intern & Remote Technical Support

Irvine, California

May 2024 – Present

- Transitioned from on-site Intern to Remote Technical Support, providing troubleshooting for dental hardware and software.
- Facilitated in the sale of 10+ Aoralcan 3 intraoral scanners through technical demonstrations.
- Designed and fabricated printed dental models and solutions for clinics and labs.
- Promoted and marketed Shining 3D dental equipment, including intraoral scanners, facial scanners, and 3D printing technologies.

NIEHS

Intern

Research Triangle Park, NC

Aug. 2021 – Sep. 2022

- Engineered 3 production web applications (TCGA Survival, Tumor Purity Prediction, and Glioblastoma Recurrence) for interactive cancer analysis using Perl CGI with Python and R backends on an Apache server.
- Handled user data submission, processing, and automated email notifications.
- Deployed XGBoost and Random Forest models for tumor purity prediction and glioblastoma recurrence analysis.

PROJECTS

Credit Card Fraud Analysis | *Python, Scikit-learn, Pandas*

Sep. 2025 – Dec. 2025

- Conducted EDA on transaction dataset and handled class imbalance using SMOTE.
- Built and optimized Random Forest, XGBoost, and Neural Network classifiers using hyperparameter tuning with a focus on minimizing type II errors.
- Evaluated models using precision, recall, F3-score, and AUC-ROC metrics with cross-validation for robust performance assessment.