Aaron Loera

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EDUCATION

University of Texas at Tyler | Tyler, TX **May 2026**

***B.S. in Computer Science, Minor in Mathematics* | GPA: 3.93/4.00**

- **Courses:** Applied Deep Learning, Machine Learning, Database Management Concepts, Data Mining, Algorithms & Analysis, Software Development, Operating Systems, Algorithms in Applied Mathematics
- **Honors:** Presidents Honor Roll (2025, 2022), Dean's List (2024, 2023)

TECHNICAL SKILLS

Languages: Python (Pandas, NumPy, Matplotlib, Scikit-Learn), Java, PostgreSQL, MySQL, MATLAB
Tools and Frameworks: TensorFlow, Keras, PyTorch, Hugging Face, Jupyter Notebook, OpenCV

RELEVANT EXPERIENCE

University of Texas at Tyler | Tyler, TX **Jan. 2025 – Dec. 2025**

Deep Learning Research Assistant

- Developed a CNN–Transformer hybrid architecture using **PyTorch** and **Hugging Face** to classify cardiovascular diseases from ECG signals, achieving **85%** multilabel accuracy across five clinical categories.
- Engineered a feature extraction pipeline for **21,000+** samples utilizing the **Neurokit** and **WFDB** modules to retrieve clinically relevant metadata, helping align model outputs with clinical diagnostic procedures.
- Cleaned and standardized Lead II ECG signals from the **PTB-XL** dataset using **Pandas** and **NumPy**, resolving **97%** of missing or malformed entries and improving downstream model performance.

Data Annotation Tech | Remote **May 2024 – Jan. 2025**

AI/LLM Prompting

- Evaluated and refined **200+** AI-generated tasks leveraging **Python** and **PostgreSQL** for algorithm optimization and data processing and management, contributing to improved code and structured data generation.
- Improved response quality from Google's **Gemini** and **BERT** models by assessing truthfulness and quality of **40+** responses through **Python** and **BigQuery**, ultimately increasing end user confidence.
- Reduced LLM hallucination rates by **15%** through systematic cross-referencing of source documents, system prompts, and external knowledge, improving model context windows and response relevance.

PROJECTS

Malicious QR Classifier | *Vision Transformer (ViT) QR Classification* **Dec. 2025**

- Fine-tuned Google's ViT (vit-base-patch16-224) in **PyTorch** to detect malicious QR codes, achieving **84%** classification accuracy and demonstrating transformer viability for visual threat detection.
- Designed a preprocessing pipeline for the **PhiUSIIL Phishing URL** dataset using the **qrcode** and **PIL** modules to convert **200,000+** URLs into standardized 256x256 QR codes, enabling efficient large-scale model training.

12-Lead ECG Classifier | *Multilabel CNN ECG Classification* **Aug. 2025**

- Developed a custom multilabel CNN in **TensorFlow** and **Keras** to detect cardiovascular diseases from 12-lead ECG signals, reaching **88%** classification accuracy across five diagnostic labels.
- Introduced a probing classifier to evaluate whether demographic attributes (age, sex, height, weight) could be inferred solely from ECG waveforms, attaining **76%** accuracy and providing insight into latent signal encoding.