

Tanay Chitlur

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Education

Carnegie Mellon University

Bachelor of Science in Computer Science

- Relevant Coursework: Discrete Math, Principles of Imperative Computation, Linear Algebra, Calculus 1–3.

Pittsburgh, PA

Expected May 2029

Westview High School

Honors Diploma — GPA: 3.98 Unweighted / 4.52 Weighted

Portland, OR

Graduated May 2026

Research and Publications

A Morphologically-Aware Transformer Network for High-Fidelity V1–V5 ECG Lead Generation

October 2025

- IEEE Sensors 2025 (24th annual): First-authored and presented a peer-reviewed paper; full text in [IEEE Xplore](#).
- Designed and trained a multi-stage transformer in Python with custom attention mechanisms, a mixture-of-experts decoder, and an eight-term composite loss function; built the full pipeline end-to-end, from data preprocessing and augmentation of 22K+ signal samples to model training, evaluation, and validation.

Transformer-Based Framework with Dynamic Multiscale Attention Mechanisms for 12-Lead ECG Synthesis

July 2025

- IEEE EMBC 2025 (47th annual): First-authored and presented a peer-reviewed paper at the largest biomedical engineering conference; full text in [IEEE Xplore](#) and PubMed.
- Engineered a novel transformer in PyTorch with saliency-driven adaptive attention windows, multi-scale feature fusion, and a custom SMAPE loss for time-series generation, enabling full 12-lead ECGs from a consumer wearable; an earlier iteration earned an International Science and Engineering Fair (ISEF) Grand Award and was presented at HRX 2024.

IntelliCane: A Deep Learning Cane for Active Obstacle Avoidance & Navigation for the Visually Impaired

May 2025

- Built a servo-guided smart cane end-to-end, from custom hardware to an on-device vision and navigation stack that actively steers visually impaired users; won the ISEF 3rd Place Grand Award and AAAI Special Award at [Regeneron ISEF](#).
- Engineered a real-time embedded system integrating computer vision (depth estimation, YOLO object detection), A* pathfinding, and LLM-based decision-making; compressed models via ONNX export and INT8 quantization to cut inference ~17x, delivering sub-second end-to-end latency on a Raspberry Pi at a \$207 total build cost.

Conference Presentations: IEEE Sensors 2025, IEEE EMBC 2025, Regeneron ISEF 2024 & 2025, HRX 2024, Heart Rhythm Society Annual Meeting (HRS'24), AI Med 2023, Baylor Scott & White Tech4Better Symposium 2025

Professional Experience

Machine Learning Engineering Intern

June 2024 – July 2026

Hello Alfred.ai

Austin, TX

- Built an ML-driven medical history bot for an AI health companion using Python, LangChain, GPT-4, and Pinecone, triaging patient history to flag when clinical care is needed; deployed to 10K+ users, resolving 85% of intake autonomously.
- Cut the time to process and distill a patient's medical history from 14 to 4 minutes and raised triage accuracy to 93% via retrieval-augmented prompting; presented results at the 2025 Baylor Scott & White Tech4Better Symposium.

Team Captain & Software Lead

November 2021 – March 2025

FIRST Tech Challenge — Team 18108, High Voltage

Portland, OR

- Led a 12-student team; wrote autonomous software with OpenCV vision and RoadRunner motion planning (PID control), raising autonomous scoring 32%; won the Control Award at the Oregon State Championship (1st of 40+ teams).

Founder

July 2019 – Present

TnT Treats® Baking LLC

Portland, OR

- Founded and scaled an artisanal dessert business to \$25K+ in lifetime sales across 1,500+ custom orders; own pricing, marketing, and fulfillment end-to-end, with 70% of revenue from repeat customers.

Awards

Coca-Cola Scholar, 2026 — \$20,000 merit-based national scholarship; 1 of 150 selected from 110,000+ applicants

ISEF Grand Award, 2nd Place — Robotics and Intelligent Machines, Regeneron ISEF, 2024

ISEF Grand Award, 3rd Place & AAAI Special Award — Robotics and Intelligent Machines, Regeneron ISEF, 2025

HackCMU, 2nd Place — Food Track, 2026

Technical Skills

Languages: Python, C++, Java, Swift, JavaScript, CUDA, HTML

ML & AI: PyTorch, TensorFlow, Keras, Scikit-Learn, Hugging Face, XGBoost, ONNX, OpenCV, LangChain, Pinecone

Data & Scientific: Pandas, NumPy, SciPy, Matplotlib, Seaborn, h5py

Tools & Platforms: Git, Linux, AWS, React, Raspberry Pi, Fusion 360, Cursor, Claude Code, OpenAI Codex