Youssef Ahmed

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AI RESEARCH | EFFICIENT ML | AGENTIC SYSTEMS | TINYML

Education

Westlake University — B.S. in Artificial Intelligence Aug 2025 – Jun 2029

- **Academic record:** 2025–26 GPA **3.787**; full scholarship recipient. Coursework: data structures & algorithms, linear algebra, calculus, physics, AI/CS.

Research Experience

ENCODE Lab, Westlake University — Undergraduate Researcher 2025 – Present

Supervisor: Prof. Huan Wang | Efficient AI, embedded ML, verification-grounded agentic systems

- Investigate hardware-aware neural networks on ARM Cortex-M microcontrollers: architecture, quantization, C/C++ implementation, memory profiling and host/device verification.
- Develop reproducible experimentation pipelines combining structured agent outputs, compiler/build gates, static/semantic checks, automated tests and MCU measurements.

Westlake Chemistry 2026 Summer Undergraduate Research Internship Summer 2026

Prof. Yiqin Gao's group | Computational chemistry

- Conducted SPONGE molecular-dynamics experiments on **862 TIP3P water molecules**; analyzed oxygen–oxygen radial distribution to characterize liquid-water structure.

Selected Research Projects

TinyMamba — Efficient Sequence Models on Microcontrollers 2025 – 2026

- Investigated quantized sequence models for audio keyword spotting on an **STM32F446RE (168 MHz Cortex-M4)**, including log-mel preprocessing, integer/C inference and end-to-end benchmarking.
- Obtained **strong test accuracy** with a **compact parameter count** on a controlled 10-keyword benchmark; tested deployment numerical consistency and profiled Flash/RAM and timing constraints.

Agentic TinyML — Verified LLM-Driven MCU Kernel Optimization 2026 – Present

- Design an LLM-driven pipeline for embedded kernel generation and controlled repair, grounded in deterministic validation, ARM compilation and hardware-facing test harnesses.
- Study fail-closed acceptance and reuse of verified deployment knowledge; record unsuccessful and unverified runs rather than treating generated code as correct by default.

Imbalanced Classification 2026

- Evaluated an imbalanced training set with stratified validation; controlled threshold tuning improved validation F1.

Teaching & Science Communication

Westlake Pre-college Physics Track (2026): Teaching assistant for high-school students; supported Su–Schrieffer–Heeger (SSH) circuit experiments, oscilloscope measurements and troubleshooting.

Zhumadian science outreach (2026): Led **five** "Tiny AI" sessions for local middle/high-school students, translating audio recognition and embedded-AI research into interactive lessons.

Honors & Distinctions

2026 National Undergraduate Innovation and Entrepreneurship Training Program: TinyMamba selected at the **national** level with **$1,500** in funding.

Photon Cup, Westlake (2026): Finalist in Westlake's university-level innovation competition, among **10 participating projects**.

Ebhar Misr AI & Technology Program: One of **6 technology-track teams** selected from an applicant pool of **5,000+**.

Technical Skills

ML & research: Python, C/C++, PyTorch, NumPy, scikit-learn, model quantization, reproducible evaluation

Systems: ARM Cortex-M/STM32, ARM toolchains, STM32CubeIDE/CubeMX, Git, Linux/WSL