Anton Melnychuk

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EDUCATION

Yale University, B.S. in Electrical Engineering & Computer Science *May 2026 (Senior)*

- **Relevant Coursework (GPA 3.7/4):** Computer Architecture (EE)†, Introduction to VLSI System Design (EE), Building Distributed Systems, Computer Networks, Building AI Infra Systems (for LLMs), Design and Implementation of Operating Systems†, Principles of Computer System Design, Proof-Based Algorithms.

Osaka Gakuin University, Study Abroad Japan, Intermediate-Advanced Japanese. *Jun 2023 - Aug 2023*

Programming Languages: Rust, C; SystemVerilog/VHDL, Python, Go, x86-asm, CUDA, git
Technologies: Xilinx, Vivado/Vitis; AWS/GCP, K8s, Docker, Terraform, Systemd; Omniverse
Language Skills: English; Ukrainian (Native); Russian; Japanese (Advanced); Polish (Limited)

RELEVANT WORK EXPERIENCE

Huawei Dresden OS Kernel Lab, Germany (Offer Extended) *Summer 2025 (not pursued/ visa constraints)*

Research Intern, Yale Efficient Computing Lab *Jan 2024 - Present [1.5 year]*

- Implemented SoC design and leveraged a Virtual File System for a first-of-its-kind QEC decoding system that overcomes real-time resource constraints using a distributed network of Xilinx VMK180 FPGAs.
- ► Partnered with AMD, supervised and co-developed a SoC management tool for remote, large-scale datacenter deployment of Xilinx Versal and UltraScale+ FPGAs, enabling runtime accelerator swapping via Device Tree (ConfigFS).

Kernel Developer & Teaching Assistant, Rust WeensyOS [Blog] *Sep 2024 - Apr 2025 [8 month]*

- ► Developed RWeensyOS (10k+ LOC), a minimal POSIX-compatible microkernel written in Rust, adopted by over 500 students annually. This is the first attempt at a full rewrite of C-Linux in Rust; discussed at RustConf'25.
- Redesigned 1/3 workload at Yale core 4.9/5 workload systems course curriculum. Adopted at Harvard starting Fall 2025. Weensy is actively used today to study address space split, and virtual memory through kernel development.

Iron Flight, Ukraine Drone R&D - Embedded/Systems *July 2024 - December 2024 [5 month]*

- Built low-latency humanitarian drones running on constrained chips; funded and deployed 125+ units in 2024.
- Designed and deployed an in-kernel edge-computing inference pipeline that partitions DNN workloads across a drone–server links, leveraging a reverse-engineered DJI VTX stack via the MIPI CSI interface to onboard FPV goggles.

Yale Undergraduate Aerospace Association, CubeSat (Satellite) Developer *Sep 2023 - May 2024 [9 month]*

- Developed the core avionics system for a CubeSat 2U satellite deployed by NASA; launched from the ISS in 2025.

PROJECTS

FPGA-Based HFT Accelerator, Personal Project [Blog] *June 2025 –Present*

- ► Custom open-source FPGA high-frequency trading accelerator, achieving sub-μs latency over NASDAQ ITCH.
- Pipelined architecture for real-time parsing, book-building, and trading with scalable throughput.

Custom CPU with Speculative OoO Execution, Computer Architecture [Blog] *March 2025 –May 2025 [2 month]*

- Built a SystemVerilog CPU with speculative fetch, dynamic scheduling, reorder buffer, and in-order retirement.
- Achieved an average 33.2% speedup on SPEC-like benchmarks with robust handling of WAW hazards and data deps.

Rust for Linux Initiative, Open-Source Contributor *June 2024 –July 2024 [1 month]*

- ► Contributed to open-source Linux kernel (Ubuntu 22.04) to allow kernel cross-compile Rust loadable kernel modules.

Yale Computer Society, Project Co-Founder & Lead Developer *Sep 2023 - May 2024 [9 month]*

- Lead a group of 9 in developing a user-friendly web and iOS cross-platform for 200+ clubs and 2000+ users.

PUBLICATIONS

Fast Raft: Hierarchical Consensus for Datacenter-Scale Systems *Nov 2024 –Feb 2025*

- ► Co-authored the first open-source implementation of Fast Raft, a hierarchical consensus protocol designed for wide-area dynamic networks; achieved up to 2× faster commit latency and 5× higher throughput compared to Raft.
- Containerized, deployed, end evaluated on AWS EKS via Terraform using HCL orchestration across three US regions.