Anton Melnychuk

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EDUCATION

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

- **Relevant Coursework (GPA 3.65/4):** Computer Networks, Building Distributed Systems, Big Data Systems (Disaggregated Infra), Computer Architecture (EE)†, Introduction to VLSI System Design (EE), FPGA-Based Acceleration, Design and Implementation of Operating Systems†, Principles of Computer System Design.

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

Programming:	Rust; C; C++; SystemVerilog (VHDL; Python; Go; Bash; x86-64 asm; Systemd)
Technologies:	AWS/GCP; K8s; Linux; eBPF/LKM; Xilinx (Vivado, Vitis); Yocto; Terraform; git
Language Skills:	English; Ukrainian (Native); Russian; Japanese (Advanced); Polish (Limited)

RELEVANT WORK EXPERIENCE

Thesis, Yale Computer Systems Lab (Prof. Bhattacharjee) *July 2025 −Present*

- Reorganized VLSI design for peripheral interfaces and data pipeline for the previously taped-out HALO, a neural-processor ASIC (BCI) accelerating Intan-based signal processing to 46 Mbps under an ultra-low-power budget.

FPGA Research Intern, Yale Efficient Computing Lab (Prof. Lin Zhong) [View] *Jan 2024 - Present [1.5 year]*

- Set up and implemented a Vivado PS/PL design for a QEC decoding system that overcomes real-time resource constraints of 100 logical qubit decoding using a distributed GTX Aurora SFP+ network across 5 Xilinx VMK180 FPGAs.
- Partnered with Xilinx to co-develop a scalable SoC management tool for remote virtual file system based deployment of Versal/UltraScale+ FPGAs, enabling Linux runtime reconfiguration with A/B fallback.

Rust Operating System, System Programming Course [View] *Sep 2024 - Apr 2025 [8 month]*

- Developed rWeensyOS (5k+ LOC), a minimal POSIX-compatible teaching-purpose microkernel written in memory-safe Rust with FFI bindings to a C/x86_64 assembly bootloader; adopted by Yale's core systems course (Spring '24).
- Assisted on a prototype Rust-based network driver for Theseus, experimental Rust operating system, with support for high-throughput NICs (e.g. 10GbE), integrating eBPF hooks for dynamic packet filtering and runtime safety analysis.

Embedded Engineer, Iron Flight (Ukraine Humanitarian Drone R&D) *July 2024 - December 2024 [5 month]*

- Partitioned drone DNN workloads from STM32 MCU to a remote host with onboard FPV goggles.

OPEN SOURCE CONTRIBUTOR

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

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

Fast Raft: Hierarchical Consensus, Performance-Based Study [View] *Nov 2024 −Feb 2025 [3 month]*

- Developed the first gRPC-based implementation of the Fast Raft (vs Raft) hierarchical consensus algorithm in Go.

PROJECTS

FPGA-Based HFT Accelerator, Personal Project (modeled after MIT 6.111) *June 2025 −Present (Ongoing)*

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

Custom CPU with Speculative OoO Execution, Computer Architecture [View] *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.

Yale Aerospace Association, CubeSat (Satellite) Lead Developer [View] *Sep 2023 - Jan 2024 [4 month]*

- Co-developed the core avionics system for a CubeSat 2U satellite planned to be deployed by NASA ISS.
- Programmed Teensy 4.1 for GPIO control, TDMA radio protocol, and implemented MOSFET power distribution.