David Savenok

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Education

University of Illinois at Urbana-Champaign **Expected May 2026**

Bachelor of Science, Mathematics and Computer Science ***GPA 3.98/4.0***

Relevant Coursework: Data Structures, Algorithms, Computer Systems, Computer Networking, Deep Learning

Experience

Software Engineering Intern **May 2025 – Present**

Everfox ***Champaign, IL***

- **Stateless RPM Overlay Package Manager**
  - Designed and shipped a stateless overlay package manager for read-only RHEL Linux dev images, bind-mounting unpacked RPM content into a writable stateless partition to enable install/update/remove across 4 internal OS products.
  - Cut developer package refresh from >60-minutes for full VM reimages to <1 minute per RPM install (95%+ reduction); supported bulk installs and safe updates via state manifests and atomic rollback.
  - Hardened overlays with SHA-256 integrity checks, SELinux/MAC relabeling, and DAC/permission preservation; built a test suite to validate contexts, placements, and system file constraints (>60k files validated/test).
- **FIPS-Compliant Lightweight Web Server**
  - Surveyed 10+ open-source servers against GRC and FIPS requirements, constrained-device footprint, and community supply-chain risk, ruling out heavyweight stacks and single-maintainer projects.
  - Configured and packet-traced HTTP/3 and TLS 1.3 stacks (tcpdump, traceroute, netstat) to verify real-world behavior; narrowed recommendations to Nginx, Jetty, and OpenLiteSpeed with hardened baselines.
  - Presented findings to the Architecture Review Board in a 30-minute briefing; became team SME on HTTP/3, TLS 1.3, PKI, mTLS, OAuth/JWT, and quantum-resistant/FIPS-approved SSL implementations.
- **Linux USB Device Security Hardening**
  - Performed in-depth analysis of Linux USB enumeration, driver binding, interface classes, and common attack vectors (BadUSB, rogue HID, keystroke injection), mapping risk across udev, USBGuard, and device-authorization paths.
  - Developed real-time auditing and correlation tooling that aggregates udev + USBGuard telemetry, producing concise security summaries and logs for system developers.
  - Automated strict USB allowlisting by programmatically updating USBGuard rules through D-Bus IPC, enabling authenticated device onboarding without manual daemon configuration edits.

Projects

Motion Tracking Turret | *github.com/david-savenok/laser_turret* **December 2025 - January 2026**

- Implemented real-time motion tracking in OpenCV (masking, contour extraction, Haar cascade models) to drive low-latency servo aiming from streamed video frames.
- Integrated a Raspberry Pi + servo driver stack and built a perfboard control circuit with a transistor-switched laser diode for reliable power control and actuation.
- Iteratively CADed a two-axis turret assembly to mount dual servos and a custom electronics enclosure, bridging mechanical constraints with manufacturable designs.

6-Axis Robotic Arm | *github.com/david-savenok/EOH-Robot* **November 2024 - May 2025**

- Led a 5-member team building control systems for a 6-DOF robotic arm inspired by the Modern Robotics UR3 for presentation at the University of Illinois's Engineering Open House (EOH) event.
- Developed Arduino Mega control framework for stepper/encoder integration and closed-loop actuation; implemented serial streaming between Python motion planning and Arduino firmware.
- Coordinated with mechanical and electrical engineering teams to integrate hardware and software components.

McKinley Health Center Chatbot | *github.com/david-savenok/health_chatbot* **January 2025 – April 2025**

- Collaborated in a 4-person team to develop an AI-powered student support chatbot using RAG for McKinley Health Center services.
- Scraped 500+ pages of health center documentation into structured JSON and enabled semantic retrieval using FAISS and SentenceTransformer embeddings.
- Delivered an end-to-end web application with a Flask API, SQLite history, and a React chat interface.

Social Media Site | *github.com/david-savenok/network* **December 2022**

- Created a full-stack web application using Python's Django framework with Bootstrap and a SQLite database.
- Integrated account/security management, posting, liking, commenting, and other interactive features.
- Applied a Model-View-Controller architecture, ensuring maintainability and future scalability.

Technical Skills

Languages: C/C++, Python, Bash, SQL, x86 Assembly
Security & Systems: RHEL/Linux, SELinux (MAC), RPM, USBGuard/udev, D-Bus, PKI/TLS, FIPS
Tools: Git, Docker, GDB