

Daniel Bashukoski

Computer Science Student — Machine Learning & Embedded Systems

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PROFESSIONAL SUMMARY

Computer Science student with a strong independent project background spanning machine learning, embedded systems, backend development, and self-hosted infrastructure. Comfortable working across the full stack of a system, from soldering and firmware to game-state simulation and container orchestration. Particularly interested in reinforcement learning, computer vision, and practical Linux/networking administration. Learns new languages and tools as projects demand rather than staying within a fixed comfort zone.

EDUCATION

University for Information Science & Technology “St. Paul the Apostle” (UIST) 2024 – 2029
B.S. Computer Science (3+2 program), 2024–2027, continuing directly into an M.S. in Computer Networking Security, 2027–2029.

OEMUC “St. Naum of Ohrid” Technical High School 2020 – 2024
Diploma, Computer Science and Automation.

CERTIFICATIONS

AI in Depth: From Machine Learning to Applications June 2026
AlbaNovus Center for Mathematics and Intelligent Systems — University of Vlora
Ten-module (90 minutes each) course certified by CData and InsightBrains, covering dense neural networks, convolutional neural networks (CNNs), recurrent neural networks (RNNs), adversarial networks (GANs), generative AI, and the ethics of AI data collection.

TECHNICAL SKILLS

Programming Languages: Python, Java, C, C#, Lua, JavaScript, PHP, SQL

AI & Data: TensorFlow, Keras, NumPy, Pandas, OpenCV

Embedded Systems: Arduino, ESP32, ESP8266, embedded C, sensor integration, circuit assembly & soldering, 3D design/printing

Web Development: HTML, CSS, JavaScript, PHP, MySQL, Bootstrap

Infrastructure & OS: Linux (Arch, Debian), Docker, Tailscale, Cloudflare, SSH remote administration, self-hosted services (Nextcloud, Open WebUI, SearXNG)

PROJECTS

Balabot

June 2025 – Present

Java, Reinforcement Learning

- In-progress bot designed to play *Balatro* at a high level using reinforcement learning, built collaboratively with my brother.
- No simulate-able external game engine exists, so the project required reimplementing the entire game from scratch in Java — every card, joker, and hand-evaluation rule (straights, flushes, etc.) — through extensive reverse engineering of the original game's behavior.
- Rewritten engine runs game states fast enough to make large-scale RL training feasible.

ESP32 Portable Pentester

May 2026 – Present

Embedded C, ESP32-S3

- Ongoing design and firmware development for a handheld multi-protocol penetration testing device, conceived as a more capable alternative to the ESP32 Marauder.
- Hardware includes an ESP32-S3 (chosen for USB and on-device ML capability), a resistive I2C display with SD card storage, NFC and GPS modules, an IR transceiver, and Li-Po power management (repurposed from the SlimeVR build).
- All firmware is written independently in embedded C, targeting WiFi, Bluetooth, IR, NFC, and physical-layer testing functionality.

Self-Hosted Homelab Infrastructure

February 2026 – Present

Docker, Linux, Tailscale

- Designed and maintain a two-machine home infrastructure: an Arch Linux laptop configured as a network-wide Pi-hole and DNS cache, and a Debian server running production-style services.
- Debian server hosts a self-hosted AI stack (Open WebUI + SearXNG serving locally-run LLMs on CPU), Minecraft servers for friends, and Nextcloud for private family file/photo sharing.
- All services are containerized with Docker; both machines are administered remotely over SSH and connected via Tailscale for secure access from anywhere.

SlimeVR Body Trackers

October 2025

ESP8266, 3D Design, Soldering

- Built a set of wireless full-body VR trackers using the open-source SlimeVR firmware.
- Independently designed and 3D-printed enclosures, then soldered and assembled the microcontroller, IMU, and battery components into working hardware across all units.

VRChat Face Tracking Driver

April 2025

Python, C#, Sockets, JSON

- Restored functionality for a VRChat facial-tracking pipeline after the original companion module (for the MeowFace app) was deprecated.
- Forked and patched the original module in C# — a language outside my usual stack — to work with current versions of the mobile app and VRChat itself.
- Wrote a Python driver to receive real-time tracking data over network sockets and pipe it into the game as JSON. Completed end-to-end in two days.

Chess Vision

November 2022

Python, OpenCV

- Classical computer vision tool (no ML) that tracks a physical chess game from an overhead camera.
- Rectifies the board into a fixed 512×512 image, grayscales and blurs frames to reduce noise, then computes a difference map against the previous frame to identify the two most-changed tiles.
- Determines which of the two candidate moves is legal and logs it, repeating in real time — simple, lightweight, and fast enough to run live.

Smart REM Alarm Clock

2023 – 2024 (2-month build)

Arduino Mega, C, Sensors

- Independent end-of-high-school capstone project. Lets the user set a minimum sleep duration with a single button press.
- System estimates sleep-onset time (~5–15 minutes, adjustable) and wakes the user with a buzzer at the next light-sleep window after the minimum duration has elapsed.
- Includes a 16x2 I2C display and a DHT11 sensor showing temperature/humidity, with an RGB LED indicating sleep-air quality; display auto-dims after 30 seconds to avoid disturbing sleep.