

Matthew Sakhno

mattsakhno@gmail.com | matthewsakhno.com | linkedin.com/in/mattsakhno

Skills

PCB & Embedded: KiCad, Altium Designer, STM32, ESP32, Raspberry Pi, NVIDIA Jetson, power distribution, controlled-impedance routing

Robotics & Controls: EtherCAT, Modbus, ROS2, RTAB-Map, SLAM, LiDAR, depth cameras, IMUs, motor drivers, encoders, ESCs, servos

Programming & Interfaces: C/C++, Python, FastAPI, UART, I2C, SPI, PWM

Mechanical Prototyping: Onshape, 3D printing, soldering, aluminum extrusion, watertight enclosures

Languages: English (Native; IELTS 8.5), French (Fluent)

Experience

Mechatronics Engineering Intern, Trajekt Sports Inc. July 2026 - Present

Toronto, Canada | Builds the Arc, a 1,200-lb AI-powered baseball pitching machine; 120+ deployed worldwide

Customer base includes 25 of 30 MLB teams, including the Dodgers, Red Sox, Cubs, Mets, and Blue Jays.

- Designed a production 6-layer, 48 V/30 A power-distribution PCB in KiCad with a custom STM32H533 controller, 24 V/48 V rails, smart eFuses, dual Ethernet, and 100-ohm controlled-impedance routing
- Engineered onboard remote-diagnostic hardware: four-channel current monitoring, temperature sensing, PWM fan control, a hardware watchdog, and industrial PC shutdown and power cycling
- Projected to save 15 assembly hours and approximately \$1,000 per machine, plus thousands in field-service costs
- Designed in Onshape and built a compact aluminum-extrusion and sheet-metal test bench integrating more than \$10,000 of production hardware, including all 15 motors and a Blackwell GPU-equipped industrial PC; enabled safe, accessible hardware and software testing without occupying a full Arc Machine, with a safety shroud for 3,000 rpm rubber-wheel delamination tests
- Implemented simultaneous Modbus control and telemetry across all 15 motors, then set up and tuned EtherCAT for deterministic multi-axis control on the next-generation Arc platform

Robotics Engineering Intern, Institute for Intelligent Systems and Robotics (ISIR) June 2025 - August 2025

Paris, France | Top European robotics lab advancing autonomous systems, AI, and human-robot interaction

- Designed a 4-layer PCB with an ESP32, stepper motor control, serial communication with a Jetson Orin Nano, and a soft shutdown circuit; integrated with a LiPo battery, Battery Management System and USB-C charging
- Integrated a RealSense depth camera and 360° LiDAR for simultaneous localization and mapping (SLAM) and reinforcement learning
- Deployed "RTAB-Map" SLAM in ROS2 to enable autonomous navigation and 3D environment mapping
- Trained and deployed object detection models (YOLOv8, NanoOWL) to enable real-time recognition of classroom objects and visual markers
- Built a drag-and-drop programming interface with FastAPI, HTML and CSS to make robotics and AI accessible to students

Projects

Spark Autonomous Rover - 1st Place out of 150 participants, SummerHacks August 2026

Won \$1,600 and 2nd Place in the TechNATION Data Intelligence Track for an autonomous camera rover that captures real environments and turns them into explorable 3D Gaussian-splat memories.

- Built the complete hardware and embedded-control stack: ESP32 Wi-Fi firmware, power electronics, dual-motor propulsion, servo steering, camera integration, assembly, testing, and debugging
- Designed and 3D-printed the chassis, steering linkage, and wheel adapters; captured multi-view imagery and wheel odometry for the team's COLMAP and Gaussian-splatting pipeline

Modular Autonomous Underwater Vehicle (AUV) - In progress 2026 - Present

- Designed and began assembling a modular AUV targeting 15 m depth, with a serviceable PVC pressure hull, 3D-printed bulkheads, dynamic seals, propulsion, ballast control, and a removable electronics sled
- Designed the ESP32 control architecture for a 60 A ESC, servos, pump, IMU/depth sensing, and telemetry; designed a 90-ohm USB tether PCB with ESD protection and common-mode filtering

Education

Sorbonne Université - BSc Electrical Engineering (CMI EEA), Mechanical Engineering Option

Expected 2027