Antonio Ristevski

ristevski.antonio2@gmail.com | https://www.antonioristevski.com/ | http://www.linkedin.com/in/antonio-ristevski-ece

CAREER FOCUS

Versatile electrical and computer engineer passionate about designing and developing innovative solutions to complex engineering challenges, particularly those requiring custom embedded hardware, electronics, and system instrumentation. Experienced in bringing projects from initial concept through design, validation, and final integration, with expertise in PCB design, automotive CAN networks, embedded programming, and high-speed data acquisition. Driven by a desire to continuously learn, solve challenging problems, and turn ambitious ideas into reliable, practical solutions. Values collaboration with dedicated, motivated people who share a commitment to technical excellence, continuous improvement, and achieving meaningful results as a team.

EXPERIENCE

Controls Project Manager, *KUKA Systems North America* **December 2025 - Present**

- Lead hardware, mechanical, and software design to ensure the project is completed to schedule.
- Reviewed all designs from electrical, hydraulic, pneumatic and water to ensure no major design faults.
- Monitor the project controls budget and ensure designs are cost effective.
- Organized and controlled all designated engineering; concepts, proposals, layouts, details, and reviewed these with the customer.

Formula SAE Electrical Technical Director, *Grizzlies Racing* **May 2024 – June 2026**

- Directed a 10-person electrical engineering team through 20+ concurrent projects, overseeing design process integration of critical low-voltage subsystems, including battery management, telemetry, and power distribution.
- Led development cycles from schematic design to PCB fabrication and final assembly, introducing design-for-manufacturability practices that improved reliability and reduced failure rates.
- Engineered and deployed real-time data acquisition and analysis tools improving testing day efficiency and on-track performance.
- Collaborated with motorsport engineers and industry mentors to align electrical system design with professional motorsport standards, enhancing the team's technical rigor and system reliability.
- Integrated embedded systems and sensor networks for telemetry, driver feedback, and fault detection.

High-Performance Hardware Intern, *Intrepid Control Systems* **May 2024 – August 2024**

- Engineered critical components of a next-generation embedded hardware product.
- Conducted hardware benchmarking across multiple hardware design iterations to optimize boot times, and ensure system stability.

PROJECTS

Indirect Cylinder Pressure Measurement

Designed a modular data acquisition system for the indirect measurement of in-cylinder pressure in an internal combustion engine using a strain gauge instrumented cylinder head bolt.

- Designed a modular high-speed data acquisition (DAQ) system for indirect internal combustion engine pressure measurement using strain gauges vertically and horizontally mounted on a head bolt.
- Developed a two-stage analog front-end utilizing amplifiers to condition and scale 5–100 μV micro-strain signals into a 0–5V range for digital conversion.
- Validated strain-derived pressure signals against direct piezoelectric transducer measurements to verify measurement fidelity and combustion phase correlation.
- Engineered a C-based backend architecture on a Raspberry Pi 4 to achieve deterministic sampling rates up to 90 kS/s.
- Interfaced an AD5592R analog-to-digital converter via SPI to acquire engine cycle data synchronized to a 720-pulse incremental crankshaft encoder.
- Implemented real-time data visualization featuring multi-cycle signal overlay and DMA-buffered data logging for offline CSV analysis.

Vehicle Electrical Harness Design and Manufacturing

- Designed and built a full-vehicle wiring harness integrating 60+ sensors, ECU, dual daisy-chained CAN buses, and a data logger.
- Cut harness manufacturing time from 45 to 13 hours by developing a repeatable staged process.
- Reduced harness weight by 44% through wire routing, voltage drop-based gauge sizing, and lightweight component selection.
- Developed a custom wire gauge calculator to optimize thermal, electrical, and packaging constraints.

Distributed Vehicle Electronics & CAN Bus Network V1
Designed, and integrated a modular CAN network and custom PCB suite, coordinating low-latency sensor telemetry, dynamic power management, and wireless data transfer.

- Power Distribution Module: Managed intelligent power delivery via solid-state MOSFETs, and monitored dynamic current draw, board thermals, and bus voltages with CAN status telemetry.
- Dashboard Node: Received live vehicle/engine telemetry, and vehicle dynamics metrics to display critical real-time status to the driver.
- Steering Wheel Interface Module: Embedded steering wheel node handling gear shifting logic and driver inputs over CAN.
- Wheel Sensor Expansion Module (x4): Corner-mounted data nodes featuring dual K-type thermocouples for brake fluid and pad temperature, on-board IMU/accelerometer, wheel speed sensing, and interfaces for rotor/external tire temp sensors.
- Wireless Internal TPMS Module: Battery-powered wheel node measuring internal tire temperature, gauge pressure, and relative humidity communicated wirelessly via BLE to corner Wheel Sensor Expansion Modules.
- Brake Light & Expansion Controller: Rear-mounted CAN node controlling solid-state brake lighting while providing modular analog and digital sensor expansion.
- Sensor Expansion Node: General-purpose CAN node providing additional analog and digital sensor acquisition across the vehicle network.

AI-Driven RC Car With Fuzzy Logic Motor Control & Computer Vision for Playing Live Pac Man
Developed an autonomous RC car combining ESP32-CAM image classification with Arduino-based fuzzy logic motor control. Trained a decision tree to detect Pac-Man ghosts and integrated infrared sensors for real-time obstacle avoidance and autonomous navigation.

- Computer Vision Classification: Trained a decision tree on over 2,000 images to detect Pac-Man ghosts, achieving an 8.09 percent classification error rate.
- Fuzzy Logic Motor Control: Implemented 27 fuzzy rules to translate infrared sensor measurements into adaptive motor commands.
- Embedded Systems Integration: Integrated ESP32-CAM, Arduino Uno, infrared sensors, H-bridge motor drivers, and DC motors.
- Real-Time Performance: Achieved 7–9 ms Arduino fuzzy-control execution and optimized image processing for responsive target detection.

EDUCATION

Bachelor of Science in Engineering, *Computer Engineering* **September 2022 - May 2026**
Oakland University, Rochester MI

TECHNICAL SKILLS

Protocols & Embedded Interfaces: CAN Bus Architecture | SPI | SPI DMA | I2C | UART | BLE (Bluetooth Low Energy) | Wifi 4
Microcontrollers & Embedded Platforms: ESP32 | STM32 | Raspberry Pi | Artix A7-50T FPGA | Zynq-5000
Harness and Embedded Hardware Design Tools: Altium Designer | Kicad | Vitis | Espressif IDE | GitHub | Rapid Harness | PSpice | LTspice | Saturn PCB Toolkit | Vivado 2019.1
Other Design Tools: MATLAB | Catia V5 | SolidWorks 2024 | Vehicle Spy | Motec I2 Standard | Fusion 360 | PE3 Monitor
Programming Languages: C / C++ | Python | VHDL
Lab & Bench Equipment: Digital Oscilloscope | Digital Multimeter (DMM) | Function Generators | DC Electronic Loads | Reflow Ovens | Soldering Irons | Hot Air Rework Stations | Digital Microscope | Specialized Crimping & Fabrication Tools
Hardware & Electronics Design: Multilayer PCB Design & Layout | Mixed Signal PCB Design & Layout | Signal Conditioning & Amplification | Power Distribution & Management | Embedded Hardware Prototyping | Circuit Testing & Validation
Automotive Electronics & Instrumentation: Automotive CAN Networks | Electrical Harness Design | Strain Gauge Instrumentation | Sensor Integration | Sensor Calibration | High-Speed Data Acquisition | Vehicle Telemetry