



Paul M. Kruchko

Principal & Owner | Dynamis Consulting & Controls, LLC

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Curriculum vitae

Controls and embedded software engineer with more than 12 years of experience spanning automotive, Army ground vehicles, aerospace and autonomy. Combines hands-on implementation with software architecture, model-based development, systems integration, verification and technical team leadership.

Technical expertise

Controls and modeling: MATLAB, Simulink, Stateflow, System Composer, Requirements Toolbox, **Raptor®-Dev** and **Raptor®-Cal**, plant modeling, calibration, INCA, CANape, ETAS LABCAR and MIL/SIL/HIL.

Embedded platforms: C11, C++11/14, Python, Linux, QNX, FreeRTOS, ARM, NXP PowerPC, STM32, Jetson, **Raptor® RCM-112**, BSP/MCAL/HAL, board bring-up, bootloaders, CMake, Git and TRACE32.

Integration and verification: CAN, J1939-71/-76, Ethernet, TCP/UDP sockets, TSN, Fast DDS, CANoe, Wireshark, SPI, I2C, GPIO, UML/SysML, requirements traceability, MISRA, MC/DC, CMocka, static analysis, FMEA, FTA and root-cause analysis.

Architecture and engineering practice: Hardware/software partitioning; test-driven and feature-driven development; MOSA/GCIA/FACE-informed architecture; AUTOSAR Classic alignment; MIL-STD-882E, JSSSEH and IEC 61508/ISO 26262-informed engineering.

Independent consulting

Principal and Owner

Dynamis Consulting & Controls, LLC | Troy, MI | 2025 - Present

- Founded an independent practice delivering embedded controls, software architecture, integration, verification and technical advisory services.
- Led new engine-controller hardware and software architecture for natural gas and diesel gensets up to eight cylinders. Work includes first-principles requirements, hardware/software partitioning, schematic review and interfaces for injection, ignition, knock sensing and wideband lambda measurement.
- Customers include Methodica Technologies and Western Labs. Also advises on defense engineering opportunities, technical positioning and capability-to-program alignment.

Professional experience

Staff Embedded Software Engineer / Software Systems Lead

Forterra Autonomy | Clarksburg, MD | Sep 2025 - Present

- Develops safety-critical C11 diagnostics and fault-management software for commercial and military autonomous-vehicle systems on Linux and QNX.
- Defines requirements, interfaces and architecture; implements MISRA-oriented features with CMocka unit tests and MC/DC evidence for assigned functionality.
- Built a Fast DDS IPC reference and C ABI shim; supports CPU and memory analysis, distributed debugging and QNX migration.
- Supports engineering workflow improvement and cross-functional technical training.

Senior Embedded Software Engineer - Contract

GE Aerospace / Actalent | Grand Rapids, MI | Aug 2025 - Sep 2025

- Developed assurance-oriented requirements and software specifications for an aerospace network device.

Lead Software Engineer / Controls and MBD Team Lead

American Rheinmetall Vehicles | Sterling Heights, MI | Oct 2023 - Jun 2025

- Established an advanced controls and model-based development capability, including engineering standards, prototype delivery and team mentoring.
- Led production-intent supervisory controls for a 40-ton tracked hybrid vehicle using **Raptor® RCM-112** and **Raptor®-Dev** and **Raptor®-Cal**, integrating 600 V energy storage, DC-DC conversion, dual traction inverters, motors and transmission interfaces.
- Personally developed high-voltage bus and energy-storage control functions, requirements and integration interfaces.
- Supported prototype autoloader, turret and electromechanical control architectures, custom CANopen integration, TSN and embedded control platforms; connected SysML system definitions to UML software design.

Technical Manager - Electric Motor Controls and MBD

American Axle & Manufacturing | Detroit, MI | Jan 2023 - Oct 2023

- Led electric motor controls, modeling, calibration and OEM issue resolution for permanent-magnet and induction-machine applications.
- Developed induction-motor control and dynamometer methods addressing MTPA, field weakening and operating constraints; modeled a BLDC shift actuator with sensorless position/load estimation.
- Managed interdisciplinary delivery, including a period coordinating 12 staff across six OEM programs.

Professional experience continued

Embedded Systems Software Engineer

U.S. Army DEVCOM GVSC - SEC | Warren, MI | Oct 2020 - Jan 2023

- Developed modern C++ and Linux software for vehicle chassis, power and active-protection systems with distributed network interfaces.
- Performed MPC5554 VCDM platform work, including FreeRTOS integration, CAN/GPIO hardware abstraction, CMake builds and MISRA-oriented development. Assessed missing BSP/OS components and supported M109A7 technical design evaluations.
- Demonstrated a MAPS platform transition from x64/RedHawk to aarch64/Linux on Jetson AGX Xavier and built a Python/TCP simulation interface.
- Developed embedded test software for MPC5777M-based hardware evaluation.

Research Electrical Engineer / Powertrain Controls Technical Lead

U.S. Army DEVCOM GVSC | Warren, MI | Apr 2015 - Oct 2020

- Developed MATLAB/Simulink and C controls for diesel engines, the 1,500 hp AGT1500 gas turbine, tracked transmissions and electromechanical systems using INCA, ETAS and MIL/SIL/HIL methods.
- Led AGT1500 replacement-controller technical development addressing DECU obsolescence, including electrohydraulic servo fuel metering, rail pressure, torque modeling, air-fuel ratio and transmission coordination.
- Developed controls for an experimental 32-speed cross-steer transmission, including operating modes and steering-gain behavior.
- Reviewed ECU schematics and PCB designs, served as a hardware technical approver and supported EMI/EMC certification testing.
- Applied UML, feature-driven and test-driven development practices; coauthored public GVSETS papers on common powertrain control and HIL modeling.

Electronics Quality Engineer

Continental AG | Auburn Hills, MI | Jan 2015 - Apr 2015

- Performed root-cause analysis and supplier 8D coordination for 54 brake-control ECU warranty cases; only three remained no-trouble-found.

Software Validation Engineer

P3 North America | Troy, MI | Apr 2014 - Jan 2015

- Supported Ford SYNC Gen III AppLink user-acceptance testing, identifying more than 300 launch defects.
- Built an STM32 Cortex-M3 CAN test-automation demonstration for Telematics Detroit 2014 and improved an LG Chem validation workflow, reducing the backlog by approximately 30%.

Education and professional development

M.S. Electrical Engineering

University of Michigan-Dearborn | 2021

Focus: controls and signal processing. Graduate work included dynamic modeling, control systems, simulation and a convolutional-neural-network project for autonomous systems.

B.S. Electrical Engineering

Oakland University | 2014

Senior work included motor speed/torque control and a 3D-printed electromechanical test platform.

Selected training

- Defense Acquisition University Level III Systems Engineering.
- Seven MathWorks course certificates covering Simulink, C code integration, control design, Zynq SoCs, HDL generation and model-based development for ISO 26262.
- ETAS ISOLAR A/B training in AUTOSAR configuration.

Military service

U.S. Army and Michigan Army National Guard infantry service, including Stryker, fire-team leadership and staff assignments. This experience informs a practical, accountable approach to engineering leadership.

Selected publications

Hardware-in-the-Loop Plant Modeling in Support of the US Army's Common Powertrain Controller Development

M. Sprengel, S. Raman, J. Rogers, P. Kruchko and D. Pace. GVSETS, Modeling, Simulation and Software session, August 11-13, 2020. [Read the public PDF](#)

US Army Common Powertrain Controller Development for AVDS EFI Engine Application in M88 Vehicle

J. Yancone, J. Cates, D. Pace and P. Kruchko. GVSETS, Power & Mobility session, August 8-10, 2017. [Read the public PDF](#)

Professional contact

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