Velin Dimitrov

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Professional Summary

Hands-on electrical engineering manager with a startup mindset, experienced in building and scaling electrical engineering capabilities for robotics and autonomous systems from the ground up. Proven ability to own electrical/embedded systems and lead high-performing teams to deliver complex robotic platforms from early concept through reliable prototype.

Core Competencies

- Electrical & Embedded Robotic Systems Architecture
- Power, Sensing, and Compute Systems
- Vendor Relations and Low-Volume Prototyping
- Team Leadership, Hiring, and Mentorship
- Cross-Functional Program Management
- Hardware Prototyping, Evaluation, and Safety

Professional Experience

Robotics and AI Institute — Cambridge, MA

Electrical Engineering Manager, IC/Manager 50:50 — *Nov 2024 — Present*

- Lead and mentor a team of full-time and co-op electrical engineers while remaining hands-on in architecture definition, design reviews, and rapid iteration of sensing, compute, and actuation electronics for dynamic prototype robots
- Provide direct technical contribution (embedded, power distro, sensing, motor control) for multiple concurrent programs
- Define and implement EE architecture standards and best practices enabling rapid iteration with safety and scalability
- Partner closely with software, research, and IT leadership to align hardware roadmaps with program-level objectives
- Designed and launched battery, soldering, and HV safety programs, improving researcher self-sufficiency and reducing risk
- Track portfolio-level hardware risks across programs and driving shared mitigation strategies to reduce duplicated effort

Roboticist/Electrical Engineer — *Feb 2023 — Nov 2024*

- First electrical engineer on staff, owning end-to-end robot electrical system architecture from concept through prototype
- Led technical decision-making for mixed-signal, power, and embedded systems, balancing short and long term needs
- Established lab infrastructure, instrumentation, and on-site PCB fabrication capabilities to accelerate R&D velocity
- Fostered and managed a flexible vendor ecosystem enabling fast-turn, low-volume mechatronic manufacturing

Toyota Research Institute — Cambridge, MA

Senior Research Engineer — *Jul 2021 — Feb 2023*

- Lead for university/industry collaboration developing novel human-machine interfaces for autonomous vehicles
- Defined system requirements and research roadmaps for accessibility-focused vehicle interaction technologies
- Presented technical strategy and progress to executive leadership, influencing long-term mobility and autonomy initiatives

Senior Vehicle Integration Engineer — *Jan 2019 — Jul 2021*

Vehicle Integration Engineer — *Nov 2017 — Jan 2019*

- Owned system-level electrical and compute architecture for a heterogeneous fleet of autonomous research vehicles
- Led integration of compute, network, power distribution, and sensor subsystems across US and Japanese fleet of vehicles
- Drove technical trade studies and alignment across electrical, mechanical, and software disciplines
- Standardized build documentation, test procedures, and integration workflows, improving reliability and repeatability

Northeastern University — Boston, MA

Lecturer and Postdoctoral Researcher — *Jan 2017 — Nov 2017*

- Conducted research on indoor localization system for first responders with ultra-wideband radio ranging and barometers
- Taught EECE 2160, Embedded Design: Enabling Robotics, HW/SW course with Zynq SOC (ARM/FPGA/C++)

Teledyne Benthos — North Falmouth, MA

Robotics Engineering Intern — *May 2011 — Aug 2011*

- Improved vision system and operator UI including pool testing/validation on remote underwater inspection robot

Milara, Inc. — Medway, MA

Summer and Part-Time Robotic Engineering Intern — *May 2009 — May 2011*

- Assembled, calibrated, and characterized wafer handling robots including integration with linear tracks and prealigners

Education

Northeastern University — Boston, MA
PhD in Electrical and Computer Engineering, Advisor: Dr. Taskin Padir — *Sep 2015 — May 2017*
Dissertation: Model-Based Robot Control in Human-in-the-Loop Cyber Physical Systems
- NASA Space Robotics Challenge w/ Valkyrie Humanoid Robot

Worcester Polytechnic Institute — Worcester, MA
MS in Robotics Engineering, Advisor: Dr. Taskin Padir — *Aug 2011 — Sep 2015*
- DARPA Robotics Challenge w/ Atlas Humanoid Robot
- NASA Sample Return Centennial Challenge
- NASA RASC-AL Exploration Robo-Ops Competition

Franklin W. Olin College of Engineering — Needham, MA
BS in Electrical and Computer Engineering — *Sep 2007 — May 2011*

Patents

Multisensory Gestural-Audio Interface to Promote Situational Awareness — Toyota Research Institute
US20240217539A1 — *Pending*

Sensor Placement to Reduce Blind Spots — Toyota Research Institute
US11762097B2 — *Sep 2023*

Pulse Per Second Signal Generation Using a Fiber-Optic Gyroscope — Toyota Research Institute
US10914588B1 — *Feb 2021*

Selected Publications

- AthenaZero: A Low-Inertia Bimanual Robot for Dynamic Manipulation - *Science Robotics 2026* (under review)
- Autonomous is Not Enough: Designing Multisensory Mid-Air Gestures for Vehicle Interactions Among People with Visual Impairments — *ACM CHI 2023*
- Expanded Situational Awareness Without Vision: A Novel Haptic Interface for Use in Fully Autonomous Vehicles — *ACM/IEEE HRI 2023*
- Human-in-the-Loop Control of a Humanoid Robot for Disaster Response: A Report from the DARPA Robotics Challenge Trials — *Journal of Field Robotics 2015*

Tools & Technologies

Altium Designer, LTSpice, Python, scikit-rf, C++, MATLAB, Ubuntu/Jetpack, Networking, SolidWorks, JIRA