Grigor Pahlevanyan

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Education

McMaster University, B.Eng. in Mechatronics Engineering with Coop — Sept 2020 – May 2025

- GPA: 3.8/4.0
- **Coursework:** Control Systems, Software Development, Predictive Intelligence, Embedded Systems, Digital and Analog Circuit Design, Data Structures & Algorithms, Thermodynamics

Professional Experience

Tesla | Power Electronics Program Manager Intern — Palo Alto, CA May 2024 – Aug 2024

- Managed four vehicle projects, ensuring timely milestone delivery and risk mitigation across high-voltage power electronics subsystems.
- Established clear communication channels across management layers, enabling seamless coordination between hardware, firmware, and software development teams.
- Developed project roadmaps, delegated tasks to cross-functional teams, and optimized workflows to enhance efficiency in inverter and DC/DC converter design.
- Led cross-functional design reviews, aligning system architecture for vehicle powertrain and power conversion units.
- Built stakeholder confidence through clear communication, transparent progress updates, and consistent milestone achievement.
- Conducted data-driven decision-making using KPI tracking and project management tools to assess progress and optimize resource allocation in high-voltage component validation.
- Designed and implemented high-voltage safety protocols for power electronic systems.

Thales | Component Engineering Intern — Toronto, ON May 2022 – Aug 2023

- Automated database migration of 1000+ components using Python and Selenium, reducing manual data entry time by 70%
- Managed component databases, maintaining up-to-date records.
- Processed ECN requests, collaborating with design and procurement teams to ensure smooth component transitions and compliance with technical specifications.
- Conducted obsolescence analysis to identify supply chain risks, proactively sourcing alternative components and mitigating potential disruptions.
- Optimized component selection by analyzing performance, availability, and cost, leading to a 15% reduction in overall procurement expenses.
- Designed and implemented a machine-learning model to predict component failure rates, improving reliability analysis and risk assessment.
- Gained hands-on experience with high-power systems, cabling, and wiring harness manufacturing.

Extracurricular Experience

Battery Workforce Challenge | BMS Hardware Lead — Sept 2024 – Present

- Leading BMS hardware development, managing a team of 8 engineers to design, test, and integrate a high-performance battery management system for EV applications.
- Coordinating with cross-functional teams to ensure seamless system integration and optimal battery performance.
- Spearheading PCB design and firmware development for battery monitoring, balancing, and diagnostics using Altium Designer and Embedded C.
- Conducting rigorous testing and validation, implementing thermal management strategies using MATLAB Simulink to improve battery longevity and efficiency.
- Overseeing supplier interactions and procurement, ensuring cost-effective sourcing of automotive-grade BMS components such as TI and NXP chipsets.
- Designed and built custom wiring harnesses for battery module integration and validation testing.
- Designed flexible PCBs for compact battery management solutions, ensuring durability and signal integrity.
- Programmed ESP32 microcontrollers for real-time data acquisition and communication.
- Implemented CANbus and I2S communication protocols for seamless data transfer across subsystems.

Solar Car Project | Electrical Manager — Nov 2021 – Aug 2024

- Managed electrical team workflow, overseeing design, testing, and validation of power electronics, battery systems, and control circuits.
- Designed a 110V high-voltage electrical architecture for efficient power distribution, enhancing vehicle performance and safety.
- Developed an Automatic Transfer Switch with integrated control systems to optimize energy flow between solar panels, battery, and drivetrain.
- Created a pre-charge circuit board for motor controller integration, improving safety and efficiency in high-voltage power systems.
- Engineered a 96V battery pack with comprehensive BMS implementation, ensuring real-time monitoring and fault detection.
- Designed a Power Management board to regulate and distribute power efficiently across the vehicle's subsystems.
- Implemented a Pedal Control program utilizing analog-to-PWM signal conversion for precise throttle response.
- Used Altium and Eagle for PCB design, prototyping, and manufacturing, optimizing circuit layouts for reliability and performance.
- Researched and implemented Maximum Power Point Tracker (MPPT) devices to maximize solar energy harvesting efficiency.
- Led integration and validation efforts, collaborating with mechanical and software teams to ensure seamless system functionality.
- Performed hands-on soldering, circuit assembly, and wire harness fabrication for both high-voltage and low-voltage vehicle systems.
- Assembled and tested battery pack modules, implementing effective cooling and thermal management techniques.
- Designed and validated comprehensive battery management system (BMS) solutions for state-of-charge monitoring and fault diagnostics.

Vehicle Safety Mechanism | Independent Research Project — Nov 2021 – Present

- Invented an AI-powered safety seat system using LiDAR for real-time collision detection and impact mitigation.
- Developed machine-learning algorithms for dynamic seat position adjustment based on occupant weight, posture, and collision threat level.
- Integrated NVIDIA Nano Jetson, AGX ORIN, and Oak-D Lite 3D camera to enable real-time processing of depth and motion data.
- Engineered an electromechanical control system using stepper motors and high-power transformers to adjust seat positioning within milliseconds.
- Designed and simulated safety protocols using MATLAB and Simulink to ensure compliance with automotive safety standards.
- Designed a custom PCB using Altium for sensor integration and control, optimizing real-time responsiveness.
- Manufactured PCBs using JLCPCB for seamless hardware integration and testing.

AI Meeting Assistant | visit at chatwithama.com — Sept 2024 – Present

- Developed an advanced meeting analysis system utilizing OpenAI's Whisper for high-accuracy speech recognition and transcription.
- Implemented speaker diarization using pyannote for precise speaker identification and segmentation within conversations.
- Integrated LLM models, including Ollama 3.2, for automated generation of meeting minutes, action items, and summarization of key discussion points.
- Designed and developed a web-based interface using React.js, JavaScript, and Python, enabling real-time analytics and insights.
- Deployed the solution using Docker for local hosting and scalable deployment, ensuring efficiency in processing high-volume meeting data.
- Designed a custom microphone using Altium for optimized voice capture, performing signal processing with STM32 for enhanced audio quality.
- Manufactured PCBs using JLCPCB for seamless hardware integration and testing.

Publications

Vehicle Seat Design to Mitigate Collision Impact on Occupant Safety — July 2023

BRIC Symposium Proceedings
Certificate of Participation

Technical Skills

Software Development: C++, C, Python, Julia, MATLAB/Simulink, Git, Docker, React.js, Node.js

Electrical Design: Altium Designer, Eagle, Fusion 360, LTSpice, NI Multisim, KiCad

Mechanical Design: SOLIDWORKS, Autodesk Inventor, AutoCAD

Machine Learning: Neural networks, reinforcement learning, model predictive control, speaker diarization, Ollama 3.2, LLM integration

Embedded Systems: ESP32, STM32, ARM Cortex-M, FPGA design, I2C, SPI, CANbus, UART

Other Tools: SAP ERP, CleaQuest, GitHub, Wireshark, JIRA, Confluence, Polarion, Docker, ROS, Linux administration

Hardware Prototyping: Custom PCB design with Altium, JLCPCB manufacturing, soldering, signal processing, oscilloscope debugging