Amar Persaud

Summary

Hardware and Embedded Systems Engineer with experience in power electronics, firmware, and automated test development for industrial systems. Experienced in hardware design and layout, troubleshooting, generating detailed engineering documentation and communicating key findings effectively across multidisciplinary teams.

Contact and Links

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Education

- Stony Brook University (2018-2023)
  - Bachelor of Engineering in Electrical Engineering (B.S.)
  - Relevant coursework: Advanced Programming and Data Structures, Embedded Microcontroller Systems Design, Deterministic and Random Signals and Systems, Modern Circuit Board Design and Prototyping, Computer Vision

Certifications

- IPC-A-610

Work Experience

- Electrical Engineer at North Atlantic Industries (Mar. 2025 – Present)
  - Implemented firmware, hardware, and test adjustments for VPX power supply products to resolve customer and manufacturing issues
    - Issues involving IPC, I2C, control loop tuning, parasitics, signal integrity and EMI
  - Performed bring-up, Engineering Verification Testing (EVT) and Design Verification Testing (DVT) to ensure function and compliance with existing standards (e.g. MIL-STD-704, MIL-STD-461)
  - Performed schematic design, board layout and testing for products, fixtures, adapters and tools
  - Created wiki-style documentation on processes, procedures, test code and firmware, circuit design implementations within NAI power supply products, common issues and their solutions, etc.
    - Improved troubleshooting, reduced technical debt from repeating troubleshoot on undocumented solutions to hardware and firmware issues
    - Performed circuit analysis and reverse engineering of legacy designs and schematics
    - Connected generated documentation to RAG based LLM for AI collaborative troubleshooting

- Evaluated components for new designs and obsolete component replacement
  - Creation and management of Bill of Materials (BOM) in Agile asset tracking software
- Created Computer Vision system to scan Datamatrix barcodes on multiple units, reducing wasted time between tests

- Production Test Engineer at North Atlantic Industries (Nov. 2023 – Mar. 2025)
  - Designed and fabricated, and performed troubleshoot for test fixtures, harnesses and backplanes for use at benches and with ATE
  - Wrote and updated tests for ATE following ATP specifications
  - Created automated turn on and calibration procedures for power supply products using equipment connected via serial, USB and GPIB, reducing time by up to 90%. Increased reliability and accuracy of calibration
    - In one case, up to 50% of units failed. This was reduced to less than 0.5% with the automated calibration process.
  - Resolved and documented production, hardware design, assembly, automated test, ESS, and RMA issues
  - Performed component level troubleshooting and discussed changes with Engineering department and vendors to resolve manufacturing issues across a wide variety of products
  - Consolidated documentation on common issues across product ranges for troubleshooting and updating manufacturing processes

- Electrical Engineering Intern at North Atlantic Industries (May 2023 – Nov. 2023)
  - Wrote firmware and made hardware design changes for upgrading high density modular VPX rack mounted power supplies and retrofitting existing devices
  - Implemented a two-phase 5V, 80A buck converter with current mode control using a DSP microcontroller
  - Assembled, calibrated and tested power supply units through ATE, ESS (temperature and vibration testing).

Engineering Projects

- High Current Multi-phase Buck Converter – Senior Design Project (Sept. 2023 – May 2023)
  - Led circuit analysis, schematic design, and performed PCB layout and assembly
  - Collaborated with others to design and fabricate a high current, low-cost, 4-phase buck converter, with a 90% efficiency, 5-12V input, and with a 75W/75A and 1V output.
- Portable Eurorack Compatible Synthesizer with Voice Cards (Nov. 2022)
  - Designed and fabricated 5 interconnecting PCBs using surface mount components in Fusion 360
  - Assembled and tested a Lithium-Ion based power supply with ±12V and ±5V output and USB-PD charging
- Machine Learning Autoencoder (Nov. 2021)
  - Developed and trained a TensorFlow based autoencoder neural network model in Python for computer compressing images of faces into a latent space and generating images of faces from the NIST Celeb A dataset
- Electronic Braille Display Module (Sept. 2020 – Dec. 2020)
  - Designed an affordable electromagnetic braille display module using latching solenoids as opposed to more expensive piezoelectric elements, with integrated H-bridge drivers
  - Reduced estimated module production cost by over 80%, enabling broader availability
- N-Body Simulation (Aug. 2017)
  - Wrote a particle simulation with gravity based on the Verlet integrator, utilizing the Barnes-Hut quad-tree optimization algorithm.
  - Utilized open-source technologies for parallel graphical and computational acceleration (OpenGL, OpenCL)

Technical Skills

- Software
  - IDEs: Visual Studio, Microchip (Atmel) Studio, TI Code Composer Studio, CVI, MCUXpresso
  - EDA and CAD: Siemens PADS, Fusion 360, OrCAD PSpice, LTSpice, KiCAD, FreeCAD, MathCAD, Altium, AutoCAD
  - Windows, Linux, MATLAB, Git
- Programming and Markup Languages
  - C, C#, C++, Python, AVR Assembly, Java, LaTeX, HTML, CSS, JavaScript, PHP, Verilog
  - Unit testing, CI/CD pipelines, REST APIs, Databases (SQL, SQLite), object-oriented and functional programming
- Equipment and Testing
  - Oscilloscopes, Logic Analyzers, Bench Power Supplies, Multi-meters, Function Generators, Electronic loads, Hipot testers, Thermal cameras, Differential Probes, Current Probes, current shunts, Microscopes, Thermal chambers, Vibration Tables
  - EVT, DVT, EMI Testing, Environmental (ESS / Temperature and vibration) testing, Transient testing, Automated Test Equipment
  - Component level troubleshooting, Live debugging
- Microcontrollers
  - AVR, Microchip, TI, NXP, and STM Microcontrollers, DSPs, Multi-core MCUs
  - ADC, DAC, Timers, Counters, PWMs, Analog Comparators, GPIO
  - SPI, I2C, I2S, Serial (UART/RS-232/RS-485), GPIB/HPIB (IEEE 488)
  - Digital Filtering, Finite State Machines, Inter Process Communication
- Design and Fabrication
  - Power conversion topologies:
    - Buck, Phase-shifted full bridge (PSFB), H-Bridge, Synchronous rectification, Ćuk, Flyback, current doubler, boost/PFC, buck-boost
  - Soldering (SMT and THT), PCB schematic design and layout, wiring harnesses
  - 3d modelling, 3d Printing, CNC / subtractive manufacturing