Spencer Beer

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Summary

- Strong academic record with a passion for continuous learning and a desire to contribute to cutting-edge technologies in the field of cyber security, embedded systems, machine learning, and automotive systems. Possesses a solid understanding of embedded programming, operating systems, and computer networking / security.

Education

- ***Colorado State University / Aug. 2020 – May 2024***
  Bachelor of Science in Computer Engineering **|** GPA 3.6 | Embedded Systems and IoT with a minor in Machine Learning
- ***Colorado State University / Aug. 2024 – May 2026***
  Master of Science in Systems Engineering | Research in Embedded and Heavy Vehicle Cyber Security

Technical Skills

- ***Programming Experience*:**
  - Java, JavaScript, C / C++, SystemC, Python, MATLAB, Assembly (ARM / MIPS / x86), HTML, CSS (+Bootstrap), Verilog, VHDL, PowerShell, Bash, Sockets, SQL, YAML, Machine Learning (TensorFlow, TensorFlow Lite, PyTorch, scikit-learn, OpenCV), Parallel Programming (CUDA, OpenCL, OpenMP), Shell scripting, JSON / XML parsing.
- ***Software Tools*:**
  - Visual Studio Code, Quartus Prime II, Keil uVision5, Cadence, Fusion 360, Git, GitHub, Microsoft 0365, GEM5, Sniper, Arduino, PlatformIO, SysAdmin Tools (Clonezilla, MDT, SCCM, SaltStack, Docker, Ansible, and misc. command-line tools), Cybersecurity Tools (Wireshark, Nmap, Burp Suite, Ghidra, Metasploit, Nessus, and misc. command-line tools), Networking (Wazuh, WireGuard, pfSense, OpenWRT, VLAN configuration, DNS, DHCP), Automotive Tools (DG Tech, GNU Radio, Scapy-Autmotive, can-utils), Cloud Platforms (AWS, DigitalOcean), Virtualization (Hyper-V, Vagrant, WSL).
- ***Other Skills*:**
  - Soldering (including surface-mount technology), Reverse Engineering (hardware and software), Embedded OS (Yocto, Buildroot, FreeRTOS), Microcontrollers & SBCs (STMicroelectronics, Espressif Systems, Arduino, Raspberry Pi, BeagleBone Black), Software and Hardware Optimization Techniques, Logic Analyzers and Oscilloscopes, Various Communication Protocols (SPI, I2C, CAN, LIN, Ethernet/802.11xx, UART, RS-485/232, JTAG, SWD, MQTT, PCI, SATA), I/O (GPIO, ADC, DAC, PWM), Memory Systems (DDR, NAND, NOR, SRAM, DRAM), Standards (SAE, AUTOSAR, POSIX), RF/SDR (GNURadio, RTL-SDR, HackRF One), PCB Design (KiCAD, Altium Designer), Firmware Development (Drivers), Signal Processing (MATLAB, NumPy, SciPy), Agile and DevOps Methodologies (CI/CD).

Engineering Projects

- ***Ultimate Truck Hacking Platform / Current:***
  - Research Project with the NMFTA, used in heavy vehicle network analysis. No other project interoperates like the UTHP.
- ***Smart 3D Printing / May 2024:***
  - Raspberry Pi 3B+ used as 3D print server and monitor, with upgraded Ender 3 Pro firmware.
- ***CAN-AUTO-IDS / May 2024:***
  - Custom autoencoder analysis in detection of common attacks on the CAN bus.
- ***Screamba / May 2024:***
  - Raspberry Pi 5, and knock-off Roomba retrofitted with an IMU used to scream at owners.
- ***Electric-Go-Kart / May 2024:***
  - Capstone project with E-Kart team at CSU. Served as the computer vision and ECU communications engineer.
- ***Autonomous Pedestrian Detection with Depth Estimation / Dec. 2023:***
  - Developed a Stereo Depth Estimation and object detection algorithm for the Raspberry Pi 4B.
- ***ESP32 "Smart Fish Tank" / May 2023:***
  - Team based, embedded sensor and monitoring project used for aquariums, developed with Arduino C++ libraries.

Work Experience

- ***Research Associate, Systems Cyber, CSU / Current***
  - Bendix Brake Certified
  - C/C++ programming
  - CAN network development and diagnostics
  - Embedded OS Development
- ***Engineering Technical Services Support Technician, CSU / Aug. 2022 – Jan. 2024***
  - Managed domain computers with SCCM
  - Debugged hardware and software issues
  - Gained fundamental skills in the CLI and scripting
  - Worked on IT / administrative open-source tools
  - Imaged and understand Windows 10/11 and Unix/Linux OS
  - Wrote technical documentation and solutions articles
- ***Engineering Success Center Staff, CSU / May 2022 – Aug. 2022***
  - Developed a touchscreen kiosk solution for front desk with Windows 10, Power Automate, and PowerShell

Leadership & Involvement

- Car Hacking Village/ Nov. 2024
Black Hat MEA village volunteer instructor

- Ski & Snowboard Swap / Dec. 2015 – Dec. 2018
Organized affordable gear for local ski community

- Cross Country & Track Team Leader / Dec. 2019
Assistant coach for high school track & xc team