Timothy Brom
Grand Rapids, MI
tim@vernda.net
(616) 287-0309

Cyber-Physical Systems Security - Automotive - Aerospace - ICS/OT - Medical

Work Experience

- **Owner and Principal Consultant** — Grand Rapids, MI
  Vernda LLC — Jan 2026 - Present
  - Independent cybersecurity consulting for connected cyber-physical systems across automotive, heavy trucking, aerospace, medical devices, and industrial control systems.
  - Conduct design reviews, penetration testing, and ongoing security advisory to identify vulnerabilities, implement effective controls, and balance security with business needs.
  - Translate complex technical findings into actionable guidance for engineering teams and executive leadership, enabling secure system development from the ground up.
  - Provide expert witness and litigation consulting services in automotive and embedded cybersecurity matters, including technical report preparation and expert testimony.

- **Security Engineer** — Grand Rapids, MI
  Metalware — Aug 2025 - Jan 2026
  - Developed processor emulation support to enable next-generation automated firmware fuzzing
  - Designed and implemented a digital twin for ARM Cortex-R based firmware within the automated fuzzing platform
  - Conducted in-depth analysis of Android and Linux-based hardware to identify backdoors, malicious code and security weaknesses.

- **Director, Cyber Physical Systems Security Research** — Grand Rapids, MI
  GRIMM — Oct 2015 - Aug 2025
  - Directed team of security researchers, responsible both for successful delivery of 15-20 projects per year and strategically developing skills and capabilities to serve our markets of Automotive, Aerospace, Medical Devices, ICS, and other connected embedded systems.
  - Led aerospace security assessments aligned with DO-326A (Airworthiness Security Process) and DO-356A(Airworthiness Security Methods), supporting clients in threat condition identification, security risk assessment, and security development assurance.
  - Performed ICS/OT security assessments for industrial control systems, evaluating network segmentation, field device security, and control system resilience against cyber threats.
  - Leveraged strong communication and client management capabilities to deliver a positive experience before, during, and after each assessment. Most clients become repeat customers.
  - Uncovered security vulnerabilities, provided threat, vulnerability and risk assessments and expert insight to dozens of clients in automotive electronics, industrial control systems, aerospace and consumer devices through advanced hardware hacking, reverse engineering techniques and deep insight into the nuances of each industry served.
  - Retained as a testifying and consulting expert witness in automotive cybersecurity litigation, including preparing a technical expert report for one matter and preparing for deposition and trial testimony in a second (case resolved via directed verdict prior to testimony).

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- **Embedded Software Development Engineer** — Zeeland, MI
  Gentex, Inc — Sep 2012 - Oct 2015
  - Spearheaded the redesign of the HomeLink® vehicle-to-home wireless communication system, enhancing user experience and system performance. Increased system responsiveness and reduced costs associated with maintining Homelink.
  - Contributed to the development of a cutting-edge full-display mirror product, pushing the boundaries of in-vehicle technology and creating a new product offering.
  - Developed an adaptive high-beam system using machine vision for object identification, improving driver safety and visibility. Improved system performance within the constrained processing environment.
- **Senior Software Engineer** — Grand Rapids, MI
  Belcan Engineering Group, Inc — Apr 2011 - Sep 2012
  - Created drivers and a VxWorks 653 v2.3 BSP for a safety critical PowerPC aerospace project
  - Wrote i2c and RS-232 serial drivers for vehicle management system
- **Software Engineer** — Grand Rapids, MI
  DornerWorks Ltd. — Jan 2009 - April 2011
- **Adjunct Instructor** — Wyoming, MI
  ITT Technical Institute — Mar 2009 - April 2011

Skills

- **Domains:** Automotive, Aerospace, ICS/OT, Medical Devices, Connected Embedded Systems
- **Industry Standards familiarity:** ISO 21434, MISRA, IEC 62443, DO-326A, DO-356A, DO-178C, ARINC 653, FDA Cybersecurity Guidance, NIST CSF
- **Technical Skills:** Hardware and software reverse engineering, penetration testing, firmware fuzzing, threat/vulnerability/risk assessment, hardware security modules (HSM) / secure elements, embedded development
- **Protocols and Interfaces:** CAN Bus, TCP/IP, WiFi, Bluetooth, RF, I2C, RS-232
- **Languages:** C (including MISRA) and Python. Familiarity with ARM, PowerPC, x86 assembly, Rust. Prior experience with C++, Perl, LaTeXand Java.

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Education

- **University of Kentucky** — Lexington, KY
  Masters of Science in Computer Science
- **Calvin College** — Grand Rapids, MI
  Bachelors of Computer Science

Academic Activities and Experience

- **Teaching Assistant/Graduate Student** — Lansing, MI
  Michigan State University Computer Science Department — August 2011 - April 2012
  - Teaching CSE251 "Programming in C," a C programming course for Electrical Engineering students
  - Performing bioinformatics research, focusing on methods to handle large data sets generated by next-generation shotgun sequencing techniques. Improved algorithm efficiency by 20 percent.
- **Research Assistant** — Lexington, KY
  University of Kentucky Computer Science Department — August 2007 - December 2008
  - Ported FDK-type Computed Tomography reconstruction algorithm to a Graphics Processing unit. Achieved 70x speedup over commodity x86 CPU.
  - Optimized the parallel (MPI) program for converting the output from a CT scan into a voxel set. Optimzed runtime efficiency, reduced program runtime by 50 percent.
- **Abstraction** — Grand Rapids, MI
  Computer Science Club — September 2004 - May 2007
  - *President* (2006-2007) - Ran meetings, created agendas, organized 2-3 colloqiua per semester.
  - *Vice-President* (2005-2006)

Publications, Talks and Projects

- CANT: https://github.com/bitbane/CANT
- IOT: The S Stands for Security, presented at Big Data Ignite, Grand Rapids, Sep. 2018
- When CAN CANT, Presented at Shmoocon, DefCon, and the SANS Auto Summit in 2018
- On-site Scanning of 3D Manuscripts
  Timothy H. Brom, James Griffioen, W. Brent Seales
  Presented at Digital Humanities 2009
- Microwulf: a beowulf cluster for every desk
  Joel C. Adams and Timothy H. Brom
  SIGCSE '08: Proceedings of the 39th SIGCSE technical symposium on Computer science education