Charles Wilson

charles.wilson@gmail.com | https://linkedin.com/in/charleswilson | https://charleswilson.blog

Internationally recognized cybersecurity thought leader with focus on product cybersecurity development lifecycle. Extensive threat modeling, product cybersecurity training development, secure decentralized multicast protocol for embedded devices, and a security development lifecycle suitable to achieve compliance for safety-critical, cyber-physical systems. Noted technical fellow and subject matter expert who has participated in multiple cybersecurity-related committees (current chair of SAE J3254 on cybersecurity maturity models). Other notable achievements include participating in the open source community (OASIS SARIF), presented at conferences, and facilitated in FDA/MDIC/MITRE cybersecurity workshops.

AREAS OF EXPERTISE

Cybersecurity Development Lifecycle | Process Documentation | Threat Modeling | Regulatory Compliance
Project Management | Cybersecurity Engineering | Mentoring | Training

PROFESSIONAL EXPERIENCE

MOTIONAL, Boston MA December 2019 - July 2024
Technical Fellow, Cybersecurity Engineering
Served as product cybersecurity development lifecycle practice lead. Mentored teams and individuals.

Lifecycle Practice:
- Served as product cybersecurity development lifecycle practice lead
- Created a series of cybersecurity training videos based on the AVCDL [https://youtube.com/@AVCDL]
- Created a cybersecurity development lifecycle capable of satisfying ISO/SAE 21434, ISO 24089 and UN R155/156, and overlaying ISO 12207/15288 [https://github.com/nutonomy/AVCDL]
- Served as editor and advisor to cybersecurity SMEs providing AVCDL secondary process documents
- Worked with certification body to validate efficacy of AVCDL toward 21434/24089/R155/R156 certifications
- Developed a visual design language for use in cybersecurity process documentation
- Created a cybersecurity supply chain framework and associated guidance documents (MDS, CIA, supplier maturity)
- Participated in cybersecurity requirements development based on my cybersecurity taxonomy-based gap analysis
- Designed a taxonomy for cybersecurity requirements and performed gap analysis of existing requirements

Leadership / Cross-team:
- Participated in organization-level regulatory compliance efforts
- Participated in the efforts toward submission of multiple cybersecurity-related patent applications
- Created and gave a presentation on the application of threat modeling tools to the issue of privacy
- Mentored junior team members
- Worked with cybersecurity management and project management to develop group schedule
- Worked with safety, systems, project management and development toward adoption of the AVPDL
- Created and gave multiple presentations on various aspects of cybersecurity to educate other teams and management (including board level)
- Worked with safety group to ensure a coordinated development process

Industry Participation:
- Invited speaker at various technical conferences (SAE WCX, Auto-ISAC, Automotive IQ)
- Member of UNECE WP.29 CS/OTA IWG TF (task force for ISO 24089 and UN R156 harmonization)
- Created and presented a course on cybersecurity metrics for a joint Auto-ISAC / NHTSA training project
- Chaired SAE TEVEES183A3 (maturity model for ISO/SAE 21434)
- Worked on the team which provided official SAE feedback to NHTSA's cybersecurity guidance
- Created summaries of cybersecurity-related ISO standards under development
- Twice served on joint MDIC / FDA / MITRE threat modeling bootcamp training staff
- Member of the ISO/SAE 21434 committee (USTAG)
- Member of OASIS SARIF working group

DRÄGER MEDICAL SYSTEMS, Andover MA October 2016 - December 2019
Senior Architect
Served as Infinity product line cybersecurity architect and cybersecurity subject matter expert.

- Designed a decentralized multicast cryptography system usable by highly-constrained embedded systems
- Served as Infinity product line security architect
- Served as cyber security subject matter expert
- Served as C/C++ subject matter expert
- Led the effort to perform a modern threat modeling across the entire product line
- Presented (multiple times) a 2-hour software security fundamentals class for managers and software developers
- Trained and mentored threat modeling facilitators
- Designed and oversaw the refit of a conference room for use in threat modeling efforts
- Created and presented a 2-hour software security fundamentals class for managers and software developers
- Created and presented an 8-hour threat modeling class for software developers and risk managers
- Designed and led an effort to do modern threat modeling on company products
- Designed and led and effort to move code signing to a self-contained, FIPS-compliant, HSM-based system
- Mentored junior developers and interns
- Led an effort to uplift 3M lines of C89 / C++98 code to C11 / C++11
- Member of ISO C and C++ committees
- Chair of ISO JTC1 SC22 WG14 TS17961 (Safe and Secure C)
- Served as subject matter expert to legal department on open source library integration
- Created and presented (multiple times) 15-hour class in Python for C developers
- Created and presented (multiple times) 15-hour class in C++14/17 jumpstart for C developers
- Created and presented (multiple times) 15-hour class in C++14/17 advanced for C++03 developers
- Championed modern secure software development, open source best practices, and use of C++14/17
- Wrote code to support Windows-specific cryptographic operations (C++)
- Designed and led an effort to move a 20-year-old Sun SPARCstation-based Unix cluster to a virtualized environment capable of producing binary-identical programs

DELL, Round Rock TX / Portland OR May 2010 - May 2016
Principal Software Engineer
Served as Fluid Cache product cybersecurity subject matter expert. Served as C++ subject matter expert.

- Created threat model and remediation recommendations for the Windows version of Fluid Cache
- Coordinated and tracked open source / third-party library usage (Linux/Windows)
- Designed and implemented Fluid Cache Windows credential validation (workgroup/Active Directory)
- Served as subject matter expert for Fluid Cache SNMP sub-agent development (Linux/Windows)
- Ported Fluid Cache process manager service to Windows (C on Linux/Windows)
- Designed and implemented a methodology to adapt Linux daemons to Windows services (C)
- Designed and implemented a methodology to allow for efficient cross-platform (Linux/Windows) development and ease of exploration of and migration to new tool chains and open source/third-party components
- Designed and implemented a methodology to allow Fluid Cache to segregate privileged operations (C on Linux)
- Designed and implemented a high-resolution log to act as a black box for Fluid Cache (C on Linux)
- Designed and implemented an SNMP sub-agent for Fluid Cache (C on Linux)
- Developed cross-platform (Windows/Linux) software in C++ (with boost and Xerces) that abstracts device protocols (SNMP, ICMP, IPMI, WSMan, SSH, etc.) (C++ on Windows/Linux)
- Led the effort to replace sRogueWave in a 500K line code base with standard library and boost (C++ on Windows)
- Designed and implemented an SSH protocol plug-in to discover and inventory linux systems (C++ on Windows)
- Designed and implemented remote execution support to our WSMan protocol plug-in to monitor servers
- Authored white papers on using the Jenkins continuous build system, parallel software development using branches and subversion, and performing code coverage analysis with Visual Studio 2012
- Led the effort to use modern C++11 in Dell's Open Manage Essentials product
- Championed software development, source code control, build and security best practices

ADDITIONAL RELEVANT EXPERIENCE

ESLX / XTREMEEDA, Austin TX (3/2007 - 5/2009) | **Senior Consultant**
WIRELESS COMPUTING, Austin TX | **Senior Software Engineer (VP of Engineering)**
VERIPRISE WIRELESS, Austin TX (10/2000 - 3/2001) | **Research Scientist**
ALTAMIRA GROUP, Burbank CA | **Chief Software Architect (Vice President of Technology)**
METROWERKS, Austin TX | **Version Control Systems Architect (Product Engineering Manager)**
GREAT PLAINS SOFTWARE, Fargo ND | **Senior Product Analyst**
THE DREAMERS GUILD, Northridge CA | **Chief Operating Officer**
TRI-DATA SYSTEMS, Santa Clara CA | **User Interface Designer**
QUBIX GRAPHIC SYSTEMS, San Jose CA | **Software Engineer**
VOLT INFORMATION SCIENCES / AUTOLOGIC, Los Angeles CA | **Engineer**
GENERAL ELECTRIC, Valley Forge PA | **Applications Programmer**

EDUCATION

Masters of Science (MSEE), Electrical and Computer Engineering
Thesis: Aardvark: A Highly Virus-Resistant Computer Architecture
Rose-Hulman Institute of Technology, Terre Haute IN

Bachelors of Science (BSCS), Computer Science
Rose-Hulman Institute of Technology, Terre Haute IN