Richard T. Carback III, PhD

rick.carback@gmail.com   https://carback.us/rick

Objective

Interested in a technical role in engineering leadership or consulting with companies that have hard problems. My passions are secure, reliable, and scalable software, and I am looking to branch out to other disciplines. Let me help you secure your startup's infrastructure, scale up your transaction pipeline, revamp your software engineering organization's lifecycle practices, or... all of the above.

Experience

2017—*Present*   **Vice President of Software Engineering**
                   Privategrity Corporation (Elixxir). Claremont, CA

- Providing technical leadership for an early stage startup as acting VP Engineering and Chief Architect
- Cryptographic systems engineering for the next-generation anonymous cMix messaging system, with components in ReactJS, Python, and Go.

2017—*Present*   **Technical Consultant / Biohacker**
                   Flow Pharma. San Francisco, CA

- Data science support for deep learning applications
- 3d and 2d visualizations of viral structural entropy data
- Forensic file analysis and data recovery
- Miscellaneous DevOps and IT support

2016—2017   **Chief Architect and Co-Founder**
                   Lexumo. Burlington, MA

- Inventor and implementer of Lexumo's key product offering, a big data platform for tracking known vulnerabilities in open source software. This platform can be deployed in hours using Terraform & Ansible via a turn-key system to any virtual private cloud inside Amazon Web Services (AWS). We also experimented with OpenStack, Google Cloud Platform, and Microsoft Azure services.
- Design, security review, and maintenance of all platform features, including a queuing system using Celery linked to amazon web services (AWS) autoscaling group, Terraform & Ansible configuration for all infrastructure featuring a mix of Docker containers and machine instances, the frontend web application, and a data backend which utilized numerous database platforms over time, including postgresql, DynamoDB, OrientDB, Cassandra, MemSQL, and Titan. If there was a bug in any part of the platform, I could find and fix it.
- Responsible for the entire software development lifecycle, which includes Continuous Integration & Deployment (CI/CD) using Bamboo, then Gitlab CI which leveraged language appropriate unit testing (JUnit, pytest, etc) and deployment through yum/rpm. Git repository hosting through Phabricator, then Gitlab.
- Artifact extraction tool in C++ that analyzed LLVM intermediate representation and creates features for heuristics and machine learning algorithms.
- Build plugin tool in Python (and some C) that traces software builds on Linux to produce submissions that feed the artifact extractor.
- Build platform in Python that analyzes snapshots of software over time via git, svn, fossil, bzr, cvs, and other revision control system histories to ingest all of the world's software at scale. This included tooling in Python, Java, and other languages to ingest all software in various software forges (i.e., maven, nuget, npm, etc).
- Vulnerability analysis tool in Python that ingests and tags vulnerability descriptions against open source software.

2013—2015   **Group Leader for Embedded Systems Security**

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2012—2013   Principal Member of Technical Staff
Charles Stark Draper Laboratory. Cambridge, MA

- Technical leader that kick started Draper's embedded security capability. Wrote proposals, customer meetings, and related activities. Served as engineering line management, participating in staffing and people management activities. Managed internal group infrastructure with Chef & Puppet depending on the project.
- Individual contributor to DARPA High Assurance Cyber Military Systems program as part of the Draper Red Team, producing the Fracture decompiler (https://github.com/draperlaboratory/fracture), an architecture-independent decompiler to LLVM IR leveraging LLVM TableGen written in C++.
- Principal contributor to DARPA Big Code program as part of the Draper Deep Code team. Invented and implemented technology that was later spun out as Lexumo's key product offering.
- Technical supervisor and contributor to numerous other classified and unclassified government research programs. These focused on secure design, security analysis, and reverse engineering for embedded systems.

2009—2012   Chief Scientist
2007—2009   Research Scientist
Convergent Technologies, Inc (CTI). Baltimore, MD

- Technical proposals, responding to market surveys, participating in data calls, and presenting at or attending business meetings and conferences.
- Led and advised internal research efforts. Focus areas included digital forensics, malware analysis, virtualization, and big data problems (from embedded multi-core/parallel applications to cloud computing).
- Supported contracts for commercial and government customers to develop technical solutions as well as teach classes in networking, operating systems, reverse engineering, and related topics. Technical skills used include C, C++, Java, Bash, PHP, Powershell, Python, Perl, and other programming/scripting languages. Linux (all flavors), Solaris, FreeBSD, OpenBSD, Windows NT/XP/2003/Vista/7, and other operating systems. VMWare ESX/vSphere/Workstation and QEMU virutalization technologies. Apache Hadoop cloud computing suite. TCP/IP stack to include forensic fingerprint capabilities and various tools (nmap, p0f, nc, socat, stunnel, etc). GDB, IDA Pro, OllyDBG, WinDBG, and other programming and kernel debugger technologies. Various forensics tools (dd, reg, ProcessExplorer, regmon, chkrootkit, the rest of the sysinternals suite, and others).

2010—2012   Adjunct Professor of Computer Science and Electrical Engineering
2005—2009   Research/Teaching Assistant
Dept. of Computer Science and Electrical Engineering,
University of Maryland, Baltimore County

- Taught network security, wireless security, information assurance, and operating systems classes.
- Lead and participated in various research teams to conduct research on next generation voting systems implementations, secure write-once read many (WORM) filesystems, and other research topics.
- Member of the Cyber Defense Lab (CDL). Maintained lab website.
- Updated, designed, and created Cyber Defense Exercises (CDXs) for use in courses at UMBC.

1999—2005   Software Engineer
L-3 Communications Government Services, Inc. Chantilly, VA

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Formally known as EER Systems, located in Seabrook, MD.

- Inventory management database, barcode printing/reading system, external access for Government and Military clients via a secure website, internal access in Java and VB application clients.
- C/C++ application that automated creation of an interactive set of HTML documents from maintenance manuals. The documents were used on a portable computer to service engines and other heavy military equipment.

Education

- Ph.D., *magna cum laude* in Computer Science, University of Maryland, Baltimore County, December 2010
- M.S., *summa cum laude* in Computer Science, University of Maryland, Baltimore County, May 2008
- B.S., *cum laude* in Computer Science, University of Maryland, Baltimore County, May 2005