

# Jeff Brandon

Computer Security Engineer

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## Objective

Apply knowledge of distributed systems, reverse engineering, machine learning, and systems programming in a dynamic project environment to help meet national need for software development and information security expertise.

## Skills

**Programming Languages and Tools:** C, Kotlin, Java, C#, javascript, go, perl, python, Android, adb, x86, x86\_64, ARM, Unix, Ubuntu, Dagger2, CentOS, gdb, WireShark, SVN, Git, Jira, .Net, IDA

## Experience

**Robert Bosch LLC.** - Security and Safety Things Applications Team, September 2018 - Present  
Developer

Updated and hardened an Android application for detecting and analyzing faces. Worked in an agile environment with daily scrum. Diagnosed and addressed various bugs and application crashes. Created applications for an IOT AOSP based system that makes use of a specialized hardware for rapid object detection in streaming images.

**MIT Lincoln Laboratory** - Secure Resilient Systems and Technology, August 2016 - August 2018  
Associate Technical Staff

Tested and prepared software for an enterprise class satellite in final weeks before launch. Integrated with an established team and contributed to the logging infrastructure and telemetry downlink parsing. Used remote debugging in gdb to debug on the powerpc architecture.

Developed a secure processing platform for small (cube) satellites that utilized Xilinx FPGAs, seL4 microkernel, and NASA Core Flight Software. By providing strongly separated and permissioned spaces we reduced risk to small space assets. Designed a remotely activated root of recovery system to reset a satellite to a known capable state in event of a system failure.

Participated in a Micro UAV (quadcopter) autonomous race. Applied machine learning (tensorflow) to a computer vision problem to recognize goals in the course. Planned an optimal path and navigated the course in three timed trials.

**NASA Jet Propulsion Laboratory** - 393G, June 2015 - August 2015  
Intern

Worked with the Cyber Security team on a contract with an external client in the oil and gas industry to secure their network infrastructure, specifically surrounding their SCADA systems. I performed threat analysis, and identified potential points of entry into the secured network. I also documented potential methods an adversary could use to spread their control through the system.

**Lockheed Martin** June 2014 - August 2014

Corporate Engineering and Technology Operations - Net Centric Integration and Development  
Technical Intern

Wrote requirements for, designed, implemented, and tested a social user-group feature for an internal modeling and simulation repository called ModSTAR. I applied my knowledge of software engineering and web based development. Primarily used ASP.NET, C#, javascript, and jQuery to implement the social suite with SQL to interface with the backend database.

**Education**

**Carnegie Mellon University** – INI, M.S. Information Security, GPA: 3.8, May 2016

Awarded “CyberCorps: Scholarship for Service”

Spring 2016: Graduate Artificial Intelligence, Neuroscience for Engineers, Ethics and Policy Issues in Computing

Fall 2015: Mobile Security, Cyber Intelligence, Special Topics: Cyber Security Research

Spring 2015: Information Security Risk Analysis, Information Security Policy and Management, Introduction to Software Reverse Engineering, Secure Software Systems, Distributed Systems

Fall 2014: Introduction to Information Security, Fundamentals of Embedded Systems, Fundamentals of Telecommunication Networks, Applied Information Assurance

Summer 2014: Computer Systems A Programmer’s Perspective 15-213

**Central Michigan University** – B.S. Computer Science and Mathematics, GPA: 3.6, May 2014

Core Courses: Intro to Operating Systems, Software Engineering, Mobile Development, Advanced Data Structures, Advanced Algorithms.

**Relevant  
Coursework**

**Control Flow Integrity Research** Fall 2015 - Worked with a team of peers under mentorship of Andy White of the NSA who sponsored research on a CFI solution. Our task was to analyze and circumvent CFI if possible. We found that with a shadow stack many common attacks are thwarted. Project completed for Cybersecurity Research Seminar.

**SELinux Policy Visualiser** - Worked with a team to help make SELinux policies easier to understand under the mentorship of Jeff Vander Stoep from Google. Implemented a python policy parser which output formatted json objects to be rendered in an easy to interpret way using the D3.js library.

**Reverse Engineering**, Carnegie Mellon Spring 2015 - Performed an in depth analysis of enterprise level malware. I successfully reverse engineered through several code obfuscation and packing techniques to analyze a malicious dll with several modules. Functionality varied from data collection, self preservation routines, and communication with command and control servers.

**Embedded Systems**, Carnegie Mellon Fall 2014 – Implemented a small operating system to run on an embedded arm processor. The OS supports concurrent processes and features a rate monotonic scheduling policy. Implemented mutex’s for concurrency control.

**Malloc Lab**, Carnegie Mellon Summer 2014 – Implemented a dynamic memory allocator using a segregated list of free memory blocks to maintain the state of the heap. Reduced allocation overhead in smaller allocations by omitting footer blocks for smallest allocation classes. Use of C programming language, completion of this project yielded a strong understanding of dynamic memory management.

**Shell Lab**, Carnegie Mellon Summer 2014 – Implemented a tiny shell program capable of creating and running user processes. Supports background tasks, IO redirection, a number of built-in commands, and signal handling

for SIGINT and SIGCHLD signals. Completion of this project yielded a firm understanding of concurrent and asynchronous event handling and the process lifecycle.

**Magic Market**, Central Michigan Fall 2013 – Designed and implemented an android application while collaborating with two team members. Completion of this project provided a great team development experience, a solid knowledge base of android application development and a healthy respect version control.

## **Research**

Authored and Presented

“Course Management Systems”, (Jeff Brandon, Cameron Henige, Kyle Head, Mark Beilfuss, Tom Lagona, Rolando Casipit, and Roger Lee), Proceedings of the 2013 International Conference on E-Learning, E-Business, Enterprise Information Systems, & E-Government, WorldComp 2013