



Michael J. Mitchell, Ph.D.

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SUMMARY

- Over ten years of industry experience in research, development, and engineering roles.
- Researched, implemented, and published solutions within privacy, security, operating systems, and context-aware domains.
- Developed custom system firmware and collaborated on dozens of Android apps, totaling over half a million downloads.
- 50+ of my own open source projects on Github; 100+ technical articles & tutorials, 10+ published papers.

CORE COMPETENCIES

Programming Languages: Python, Java, C, C++, Objective-C, SQL, JavaScript, Bash, Perl, PHP, HTML, CSS.
DevOps Tools: Docker, Kubernetes, Mesos, Rancher, Vagrant, Chef, Puppet, Ansible.
Platforms/Environments: Android (SDK, NDK, system frameworks), Linux (user-space, server, kernel), macOS, iOS, Windows (user-space, server), and dozens of other standard development SDKs, APIs and toolkits.

EDUCATION

PhD Computer Science, May, 2015, Florida State University, Tallahassee, FL, Cumulative GPA 3.8.

MS Computer Science, August, 2011, Florida State University, Tallahassee, FL, Cumulative GPA 3.8.

BS Software Engineering, May, 2009, University of Phoenix, Phoenix, AZ, Cumulative GPA 3.3.

Computer Science/Management Information Systems, 2001-2005, Iowa State University, Ames, IA.

WORK EXPERIENCE

CX Lab Technical Lead/Sr. Engineer, *Mobile Dev & Service Automation, T-Mobile USA*. Bellevue, WA. 2016 – present

Centralized and optimized telemetry collection, aggregation, visualization, monitoring, and anomaly detection.

- Developed synthetic telemetry platform collecting 100K+ daily user experience data points.
- Integrated/aggregated dozens of distinct data sources for consolidated telemetry reporting and alerting.
- Detected 10+ verified service interruptions unnoticed by other monitoring platforms.
- Modernized system architecture into auto-scaling, containerized, replicated, load-balanced micro-services.

Designed, developed, and deployed comprehensive remote device access and CI/CD/CT platform.

- Utilized open-source software & off-the-self components to replace expensive 3rd party test platforms
- Prototyped and deployed novel, ARM/x86 hybrid cloud/multi-site automated testing platform.
- Enriched data collection and increased reliability with multi-site, geographically-diverse deployments.
- Platform proved to be so stable that it is now also used in network operations and for site reliability.
- Delivered platform 6 months ahead of schedule exceeding all project objectives.

Directed day-to-day development, operations and testing efforts for 5 local and off-shore contractors.

Sr. Engineer, *Product Realization, T-Mobile USA*. Bellevue, WA. 2015 – 2016

Designed, developed, and deployed comprehensive mobile device security/CPNI/PII leak detection test suite.

- Prototyped mobile app static analysis and privacy leak detection via device logs and over network.
- Outlined and architected platform, components and integrations with CI/CD/CT pipeline.

Designed and developed numerous product testing tool prototypes and proof-of-concepts.

- Prototyped novel system for ad-hoc synthetic user experience testing during massive public gatherings.
- Prototyped mobile client and aggregation agent for next generation radio analytics and diagnostics.
- Utilized novel indoor/outdoor context detection methods to enrich radio telemetry and diagnostic data.

Graduate Research Assistant, *Computer Science Department, Florida State University*. Tallahassee, FL. 2009 – 2015

Directed research efforts of 8-10 graduate and undergraduate students annually on topics in mobile computing, security, privacy, operating systems, context-awareness, and data storage.

Designed and implemented mobile security system to provide secure input and prevent sensitive data leaks.

- Modified system display rendering data path to support widget view interception and secure input of private data.
- Demonstrated practical system data storage and overhead requirements.
- Utilized novel crowd-sourced development and testing paradigm to enhance product.

Designed and implemented 600+ participant human subjects survey on mobile device usage and privacy practices.

- Developed Android and web questionnaire and scalable server back-end to collect participant responses.
- Acquired Institutional Review Board and National Science Foundation certifications and authorizations.
- Performed rigorous statistical analysis and significance testing on multidimensional dataset using custom tools.

Designed and executed three month human subjects tablet usage and privacy practices monitoring system.

- Created and extensively tested custom Android Nexus tablet firmware to transparently collect usage data.
- Developed scalable, encrypted, and anonymized server back-end for data reporting.
- Implemented system hooks for remote administration and analyzed and debugged device problems.

Co-designed malware detection system to assess security impacts of Android vendor customizations.

- Prototyped system to structurally compare Android binaries and highlight control flow graph changes.
- Analyzed sixteen pairs of Android binaries from stock Android against closed-source 3rd party Android devices.
- Evaluated system prototype for detection accuracy, scalability, and efficiency.

Designed and developed context-aware health monitoring and emergency alert mobile framework.

- Integrated hardware sensors, web services, and biological data sensors to accurately detect context.
- Developed multi-level alert system to elevate system response based on severity of detected anomalies.
- Analyzed system accuracy using human subjects and evaluated system power and storage overhead.

Collaborated on development and testing of full-storage-data-path, per-file secure deletion system.

- Prototyped legacy-compatible framework that propagates file-level information to the block-level storage layer.
- Verified implementation correctness and evaluated system I/O bandwidth overhead.

Designed and developed experiments to isolate the cause of observed multi-core I/O bottleneck.

- Modified existing benchmark utilities to support and test process/thread core affinities.
- Gained proficiency in system and kernel profiling, performance evaluation, and statistical analysis.

Co-designed and developed music analysis, classification, and recommendation system.

- Integrated audio processing with machine learning tools to perform automatic audio file genre classification.
- Incorporated fast k-nearest neighbor calculation and majority voting to determine user likes/dislikes.

Software Developer/Owner, Mitchtech, LLC. North Bend, WA/Tallahassee, FL. 2008 – present

Launched Mitchtech LLC, my own software development and consulting firm.

- Developed over a dozen Android applications with over 500,000 market downloads.
- Lead team of Android and Linux developers and collaborated on multiple software and hardware start-up ventures.
- Authored over 100 technical articles and tutorials, many featured in popular technical periodicals.
- Developed and published over 50 open source software development projects.
- Consulted on web development, networking, and Windows/Linux system administration.

Graduate TA/Course Instructor, Computer Science Department, Florida State University. Tallahassee, FL. 2009 – 2012

- Developed course materials, taught undergraduate courses, and guest lectured graduate computer science courses, including: Kernel/Device Drivers, Android Programming, Object-Oriented C++, and Business Computer Applications.

Software Developer, Catchwind Mobile Marketing. Des Moines, IA. 2005 – 2007

- Served as lead developer, system administrator, and tester for start-up mobile marketing software company.

Network Administration Intern, Briggs and Stratton Corporation. Murray, KY. 2004

- System/network administration of Windows/Novell network for 2,000 users and operated Tier II employee help desk.

SELECTED PUBLICATIONS

- **Cashtags: Protecting the Input and Display of Sensitive Data.** Michael Mitchell, An-I Wang, and Peter Reiher. *Proceedings of the 24th USENIX Security Symposium*, 2015.
- **Mobile Usage Patterns and Privacy Implications.** Michael Mitchell, An-I Andy Wang, and Peter Reiher. *Proceedings of the IEEE 2015 International Workshop on the Impact of Human Mobility in Pervasive Systems and Applications (PerMoby)*, 2015.
- **Systematic Audit of Third-Party Android Phones.** Michael Mitchell, Guanyu Tian, and Zhi Wang. *Proceedings of the 4th ACM Conference on Data and Application Security and Privacy (CODASPY)*, 2014.
- **TrueErase: Per-file Secure Deletion for the Storage Data Path.** Sarah Diesburg, Christopher Meyers, Mark Stanovich, Michael Mitchell, Justin Marshall, Julia Gould, An-I Andy Wang, and Geoff Kuenning. *Proceedings of the 2012 Annual Computer Security Applications Conference (ACSAC)*, 2012.
- **ContextProvider: Context-Awareness for Medical Monitoring Applications.** Michael Mitchell, Christopher Meyers, An-I Andy Wang, Gary Tyson. *Proceedings of the 33rd International Conference of IEEE Engineering in Medicine & Biology (EMBC)*, 2011.

- **BEAT: Bio-Environmental Android Tracking.** Michael Mitchell, Frank Sposaro, An-I Andy Wang, Gary Tyson. *Proceedings of the IEEE Topical Meeting on Biomedical Radio and Wireless Technologies, Networks, and Sensing Systems (RWW)*, 2011.
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CERTIFICATIONS, AWARDS & ACHIEVEMENTS

- T-Mobile Enterprise IT Self Service VIP, 2016.
- Certified NSTISSI-4011, National Training Standard for Information Systems Security Professionals.
- Certified CNSSI-4014, Information Assurance Standard for Information Systems Security Officers.
- Runner up, FSU 3 Minute Thesis, 2014.
- Top Accelerator Team, Microsoft Imagine Cup 2013.
- Winner ACM D-FENSE (Offensive Security) Competition, 2013.
- Runner up, FSU Three Day Startup (3DS) Entrepreneur Weekend 2012 (EventSnapp).
- Runner up, Tallahassee Start-up Entrepreneur Weekend 2011 (SocialJukebox).
- Eagle Scout, BSA.