

DAVID SOLODUKHIN

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EDUCATION

Georgia Institute of Technology - Atlanta, GA
Candidate for B.S. in Computer Science

Graduating Dec 2019

GPA: 3.96/4.0

Courses: Information Security Lab, Distributed Systems, Advanced O.S. Development, Database Systems Design, Networking

Orgs: Grey Hat Security CTF team: web exploit engineer, Collegiate Cyber Defense Competition Team, Linux Users Group;

Phi Kappa Theta (PT) Fraternity– I.T. Chair

EXPERIENCE

Prudential Financial – Newark, NJ

May 2018 – August 2018

Software Engineer Intern, Enterprise Services & Systems

- ♦ Modernized in-house Metadata Management System (TMS) web application, enabling lower query latency, a wider array of query protocols as well as reorganization into microservices.
 - Added frontend features using ReactJS (previously JSP) and rewrote Struts2 MVC functionality in Spring MVC(Web).
 - Using the Spring Framework, the application is now able to integrate with other middleware tools and provides microservices for metadata management. (Spring Web/Boot, JSP, Struts2, Maven, Gradle, Java 8, Javascript, Reactjs, ES6).
- ♦ Reduced daily build time of MMS system by several hours with multi-module Maven build scripts that automate building of Oracle ADF applications.

Georgia Tech Database Research Group - Georgia Tech

Feb 2019 – Present

Undergraduate Researcher– Dr. Joy Arulraj – Accelerating Data Analytics using Logical Zone Maps

- ♦ Aided in designing a new logical indexing structure used for caching statistical aggregates for subsets of data. Wrote mock dbms components such as a mixture model engine which would evaluate and support indexing as well as approximate query processing. (C++)

College of Computing - Georgia Tech

January 2019 – Present

Undergraduate Teaching Assistant – Design and Analysis of Operating Systems

- ♦ Responsibilities consist of grading, hosting office hours to help students understand key operating systems concepts and learn kernel programming.

Institute for Information Security and Privacy - Georgia Tech

October 2017 – October 2018

Undergraduate Researcher – Dr. Taesoo Kim – Fuzzification: Anti-Fuzzing Techniques

- ♦ Designed and evaluated new anti-fuzzing techniques to slow down modern fuzzers and protect software from malicious fuzzing.
- ♦ Wrote LLVM passes in C++ to implement anti-fuzzing techniques in existing Linux executables.
- ♦ Automated source-code instrumentation, unit testing of anti-fuzzing methods as well as analysis and plotting of fuzzing statistics with **Python**.
- ♦ Revised and edited final paper which was accepted in USENIX(2019) and Black Hat (pending).

PROJECTS, CVES, PAPERS– [GITHUB.DAVIDTHATSM.E](https://github.com/DavidThatSMe)

- Jinho Jung, Hong Hu, **David Solodukhin**, Daniel Pagan, Kyu Hyung Lee, and Taesoo Kim. **Fuzzification: Anti-Fuzzing Techniques** (to appear). In *Proceedings of the 28th USENIX Security Symposium (Security 2019)*, Santa Clara, CA, August 2019.
- **Linux Kernel Modules** (kernel v4.15.18): Developed a module which starts a UDP server process within the kernel for transmitting O.S. filesystem, process stats. Implemented a kernel module for network traffic artificial throttling and packet proxy. Modules were written in C.
- **Linux Kernel Hypervisor(KVM) Scheduler**: KVM management app that load balances up to 24 virtual machines on a multi core processor based on virtual CPU & memory load, leading to ~%5 more throughput compared to native KVM (C,C++)
- **(K)ASLR and PIE for xv6**: Implemented user-space ASLR and simple kernel ASLR for the xv6 operating system. Also added custom PIE support for xv6 binaries.
- **Map-Reduce GRPC Implementation**: Map-Reduce architecture using GRPC for distributed rpc communication. Architecture includes separate worker and master applications written in C++ with load balancing, fault tolerance and efficient sharding.
- **Wolfram Alpha Bug**: Found SSRF vulnerability in Wolfram Alpha's api giving access to premium features for free.
- Contacted WA team and exploit was patched.

SKILLS

Languages: C++, C, Java, Javascript, Python, (PL)SQL, Perl, PHP, x86/64 ISA (GAS, FASM)

Systems, Technologies/Tools: LLVM, OpenMP, MPI, Docker, KVM/QEMU, libvirt, C/Make, Android SDK/NDK, Google Test, Jenkins/Travis CI, Reverse Engineering, Linux Kernel, fuzzing, AWS:LightSail/EC2, MS Exchange; Active Directory, IDA/Ghidra, Maven, Gradle, Struts2, Nodejs, Flutter, JSP.

Foreign Language: Russian; Native Fluency