

# 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 (ΓΤ) 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 2018 – 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.COM/DAVID-SOLODUKHIN](https://github.com/DAVID-SOLODUKHIN)

- 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