Aniket Pandey

Senior Undergraduate • Mathematics and Scientific Computing

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Education Details

Indian Institute of Technology, Kanpur
B.S, Mathematics and Scientific Computing
July 2016 - May 2020

Work Experience

Software Engineering Intern May'19 - Jul'19
Cohesity Inc. Bangalore, India

- Created a parser for a log-structured distributed database to serialize **Office 365** backups to a copy-free contiguous buffer.
- Developed a library to reverse engineer exported EWS stream, tokenize SMTP headers and generate EML files from scratch.
- Integrated end-to-end workflow of parsing and recovering Outlook Emails with the company's backup indexing engine.
- Nominated as the **Best Intern Project** for providing an innovative solution to a business critical feature requirement.
- **Exposure**: C++, Golang **(2400+ SLOC)**, protobufs, RocksDB.

Google Summer of Code'18 Apr'18 - Aug'18
The FreeBSD Project Dr. Robert Watson

- Built a self-contained Regression Test-Suite for FreeBSD's Audit Subsystem with a cross-platform support for Darwin OS and x86, ARM, Sparc64, MIPS architectures.
- Contributed **500+** test-cases for **180** auditable system calls.
- Developed an automation infrastructure for the Test-Suite, which synchronously polls on a clonable special device, /dev/auditpipe, to extract out relevant BSM tokens.
- Completed the proposed work in **less than 1/3rd** of total duration. Entire Test-Suite with **9000+ SLOC** count was integrated with 12-CURRENT production branch. (**LINK**)

Security Analyst Intern Nov'17 - Dec'17
Lucideus Technologies New Delhi, India

- Built a secure social networking platform in LAMP Stack.
- Assessed the application's vulnerability against OWASP top 10 attacks and improved the feature security.
- Extensively used VAPT tools like Metasploit, Wireshark, Xerosploit, Nessus, Maltego.
- Researched cryptographical model implementation in Network & Wireless Security, analysed WEP encryption weaknesses and exploited it using aircrack-ng tool suite.

Relevant Skills

Competent	C, C++, Golang, Python
Familiar	Haskell, TypeScript, Lua, Bash
Web Tech	Django, REST, MEAN, LAMP
Utilities	Shell Utilities, Git, Docker, LaTeX, Vim

Scholastic Achievements

2014	**AIR 1**	KVS Junior Mathematics Olympiad
2014	**AIR 244**	KVPY-SA Fellowship, IISc Bangalore
2016	**AIR 908**	JEE Advanced 2016, IIT Guwahati

Relevant Projects

The University of Texas at Dallas May'18 - Jul'18
Summer Research Intern (RTE) Prof. Latifur Khan

- Research project on the implementation of Cross-Domain Adaptive Framework for Multistream data classification **(COMC)** in asynchronous data stream mining.
- Worked on performance benchmarking of an Entity extraction and Geoparser tool, CLIFF- CLAVIN, in its ability to handle multiple concurrent requests. Performance analysis was carried out on a scalable cloud environment, **JetStream**.

Pseudorandom SAT Counter Jan'20 - May'20
Drive Link: Project Report Prof. Satyadev Nandakumar

- Worked on CNF encoding of PAC learnable hypotheses to figure out acceptable randomness of certain class of UHFs.
- Developed a model using ApproxMC to enumerate the lower bound of solutions for the CNF encoded hash functions.

Enhanced L-TAGE Predictor Feb'20 - Apr'20
github.com/aniketp/cs422 Prof. Biswabandan Panda

- Recreated an improved version of the famous loop-tagged geometric length based branch predictor for Champsim.
- The predictor achieved **95.5%** accuracy on *641.leela* traces.

Hardware Cache Prefetching Sep'19 - Nov'19
github.com/aniketp/ipcp-dsp Prof. Mainak Chaudhury

- Implemented an instruction-pointer classifier and dynamic stream based cache prefetcher for multi-core processors.
- The confluence of these algorithms achieves a speedup of **9.39%** on 20 SPEC-CPU 2017 traces over no prefetching.

InHs: Oz Interpreter in Haskell Aug'19 - Oct'19
github.com/ayush268/InHs Prof. Satyadev Nandakumar

- Developed a Haskell stack based project for interpreter of a declaratively sequential & concurrent kernel language of Oz.
- Extended it to support lazy execution, thread-scheduling and message passing along with a comprehensive test-suite.

Secure Key-Value File Sharing Jan'19 - Apr'19
github.com/aniketp/file-share Prof. Pramod Subramanyan

- Developed an encrypted dropbox-like platform in **Golang**.
- Implemented transitive and anonymous collaboration using AES-CFB, HMAC, RSA based encryption and Argon2 PBKDF.

GemOS: x86 Operating System Aug'18 - Nov'18
github.com/aniketp/gemOS Prof. Debadatta Mishra

- Built a **Gem5** simulated x86 operating system with support for context switching, system calls, multithreading, interrupt handlers, RPC and Round-Robin Scheduling of processes.
- Developed an object-store **FUSE** filesystem with LRU cache.

Formal Verification of Intel's SGX Jul'18 - Sep'18
github.com/aniketp/sgx-pm Prof. Pramod Subramanyan

- Researched on modelling a formal verification of a password manager using Intel's Software Guard Extensions Enclave.
- Implemented the Rjindael **AES-GCM** 128-bit encryption.

Relevant Courses

Advanced Computer Architecture
Designing Verifiable Secure Systems
Data Structure & Algorithms
Computer Systems Security
Operating Systems
Computer Networks
Principles of Programming Languages
Statistical & AI tech. in Data Mining