

Puneet Gill

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EDUCATION

University of Waterloo

Waterloo, Canada

Doctor of Philosophy, Computer Engineering

Jan. 2021 – Present

Relevant Coursework: Software Verification using Proof Assistants

Master of Applied Sciences, Computer Engineering

Sept. 2018 – Dec. 2020

Relevant Coursework: Design and Analysis of Algorithms, Applied Cryptography, Fundamentals of Optimization, Stochastic Processes, Software Testing, Quality Assurance and Maintenance, Probabilistic Methods in Discrete Mathematics (Audit)

Scholarship: Ripple Graduate Fellowship \$25k (2020)

Bachelor of Applied Sciences, Electrical Engineering

Sept. 2012 – Apr. 2017

Relevant Coursework: Algorithm Design and Analysis, Compilers, Computer Security, Computer Networks, Robotics & Controls, Analog Communication, Digital Computers

SRI International

San Francisco, California

Summer School on Formal Techniques

June 2022

Topics included: Formal Logic, Model Checking, Static Analysis, Automated Theorem Proving

PUBLICATIONS

Finding Unchecked Low-Level Calls with 0 False Positives & Negatives in Smart Contracts

International Symposium on Foundations & Practice of Security (*To Appear*)

2022

Puneet Gill, Indrani Ray, Alireza Lofti Takami, Mahesh Tripunitara

Least-Privilege Calls to Amazon Web Services

IEEE Transactions on Dependable and Secure Computing

2022

Puneet Gill, Werner Dietl, Mahesh Tripunitara

Granularity and Usability in Authorization Policies (Best Student Paper)

2nd International Symposium on Emerging Information Security and Applications

2021

Boyun Zhang, Puneet Gill, Mahesh Tripunitara

EXPERIENCE

Department of National Defence | Data Science and Security Intern

May – Aug. 2020

Languages / Tools: Python, Scikit-learn, Wireshark

- Trained machine learning models to detect malicious TLS certificates. Achieved an accuracy of 93.8%, false positive rate of 2.17%, and false negative rate of 12.35%.
- Implemented a TLS client/server and analyzed the network traffic for TLS connections using Wireshark.

Amazon | Software Engineer

Sept. 2017 – Aug. 2018

Languages / Tools: Java, JavaScript, Amazon Web Services (EC2, S3, DynamoDB, Lambda)

- Built parts of the software that offers flexible weekly schedules for associates in the Amazon warehouses.
- Developed a software system that collects associates' preference metrics to determine the times of the week more workers are required and provided incentives for those times.

Amazon | Software Engineer Intern

Sept. – Dec. 2016

Languages / Tools: Java, JavaScript, Amazon Web Services

- Implemented a recommendation strategy service for B2B customers.

Rave | Software Engineer Intern

Sept. – Dec. 2015

Languages / Tools: Python, Go, Apache Kafka, Docker, Kubernetes

- Wrote a library for sending GCM XMPP notifications in Java supporting a throughput of 30000 messages/second.
- Optimized the server to support 3000 users in a single chat.
- Reduced latency in user chat join times from 8 seconds to 30 milliseconds in a high traffic chat.

Rave | Mobile Engineer Intern

May – Sept. 2015

Languages / Tools: Java, Python, Android

- Implemented core features of the *Rave Android App* (10 million + downloads) including sync engine algorithm, voting, and VoIP.

Pivotal Labs | Mobile Engineer Intern

Sept. – Dec. 2014

Languages / Tools: Java, Android

- Developed the Carnival Cruise android app (100K -500K downloads) which featured indoor mapping and user chat.

Citigroup | Software Engineer Intern

May – Dec. 2013

TEACHING AND RESEARCH EXPERIENCE

Teaching Assistant

Sept. – Dec. 2021

ECE 606 (Algorithm Design and Analysis)

Teaching Assistant

Sept. – Dec. 2019

ECE 606 (Algorithm Design and Analysis)

Teaching Assistant

Jan. – Apr. 2019

ECE 351 (Compilers)

Undergraduate Research

May - Aug. 2017

Advisor: Mahesh Tripunitara

Analyzed the role of semantics in writing Access control lists in OpenLDAP. Contributions included an efficient algorithm to determine the access control matrix and comparing it with the existing solution, *slapacl*

PROJECTS

Programming Language Foundations in Agda

Completed questions from the first 13 chapters of the programming language foundations in Agda textbook <https://github.com/puneetgill05/plfa>

Algorithms for Elliptic Curve Discrete Logarithm Problem

Implemented Shank's algorithm, Pollard's rho and lambda methods for solving Elliptic Curve Discrete Logarithm Problem (*Paper by: Paul C. van Oorschot and Michael J. Wiener*)

Symbolic Execution Engine and Dafny program verification

Implemented a Symbolic Execution Engine for the WHILE language. Wrote Dafny programs for various algorithms and their verification pre and post conditions.

Peer-to-Peer Content Management System

Supported functions of adding and removing of peers from the network. Maintained distributed data on the peers while satisfying a load balancing condition.

TECHNICAL SKILLS

Languages: (*proficient*): Java, Python; (*familiar*): C/C++, SQL, JavaScript, HTML/CSS, Matlab

Tools: Git, Docker, TravisCI, Amazon Web Services, VS Code, PyCharm, IntelliJ, Eclipse