Sharjeel Khan

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Klaus Advanced Computing Building 2337, Atlanta, Georgia 30332

EDUCATION

GEORGIA INSTITUTE OF TECHNOLOGY **AUG 2018 - PRESENT**
PhD in Computer Science
Advisor: Dr. Santosh Pande
GPA: 4.0

CARNEGIE MELLON UNIVERSITY **AUG 2013 - MAY 2017**
Bachelor of Science in Computer Science
Minor in Mathematical Sciences
University Honors
Dean's List (5 semesters)
GPA: 3.57

PUBLICATIONS

UNDER REVIEW

On-the-fly Code Activation for Attack Surface Reduction
Chris Porter*, Sharjeel Khan*, and Santosh Pande. (* denotes equal contribution)
[Paper]

A Compiler Driven Predictive Scheduling Framework for Proactive Workload Management
Girish Mururu, Sharjeel Khan, Bodhisatwa Chatterjee, Chao Chen, Chris Porter, Ada Gavrilovska and Santosh Pande.
[Paper]

Effective Cache Apportioning for Performance Isolation Under Compiler Guidance
Bodhisatwa Chatterjee, Sharjeel Khan, Girish Mururu, and Santosh Pande.
[Paper]

Biscuit: A Compiler Assisted Scheduler for Detecting and Mitigating Cache-Based Side Channel Attacks
Sharjeel Khan, Girish Mururu, and Santosh Pande.
[Paper]

WORKSHOP PUBLICATIONS

Formalization of Automated Trading Systems in a Concurrent Linear Framework (CLF)
Iliano Cervesato, Sharjeel Khan, Giselle Reis, and Dragisa Zunic.
Linearity & TLLA @ FLOC'18: 5th International Workshop on Linearity and Trends in Linear Logic and Applications, Oxford, UK, 2018.
[Paper] [Code] [Slides]

WORK EXPERIENCE

GRADUATE RESEARCH ASSISTANT **AUG 2018 – PRESENT**
Georgia Institute of Technology
Atlanta, Georgia

- Working with Santosh Pande on using machine learning and deep learning algorithms for program analysis and verification

RESEARCH ASSISTANT **MAY 2017 – JULY 2018**
Carnegie Mellon University
Doha, Qatar

- Worked on Meta-CLF project with Iliano Cervesato and Giselle Reis to develop the meta-theory for the concurrent logical framework (CLF)
- Formalized Automated Trading Systems (ATS) in Celf
- Proved properties about the formalization of ATS like no crossed/locked market

SOFTWARE ENGINEERING INTERN — JAN 2017 – APR 2017

MEDDY
Doha, Qatar

- Moved Transaction Emails from Django's personal email system to Mandrill
- Created the dashboard to show Google analytics and Django analytics to clinic managers for them to track their doctors
- Worked on the interface for clinics to send bulk SMS messages to their clients

TEACHING EXPERIENCE

GRADUATE TEACHING ASSISTANT

GEORGIA INSTITUTE OF TECHNOLOGY
CS6241: Compiler Design and Optimizations — Jan 2020 - May 2020
CS4240: Compilers & Interpreters — Aug 2019 – Dec 2019

- Tutored students about material and concepts taught in the class during my office hours
- Taught during the recitations
- Answered questions on Piazza
- Graded the assignments

UNDERGRADUATE TEACHING ASSISTANT

CARNEGIE MELLON UNIVERSITY
36-217: Probability Theory and Random Processes — Jan 2017 - May 2017
15-210: Parallel and Sequential Data Structures and Algorithms — Jan 2017 - May 2017
21-241: Matrices and Linear Transformations — Aug 2015 - Dec 2015
15-150: Principles of Functional Programming — Aug 2015 - Dec 2015
15-122: Principles of Imperative Programming — Jan 2015 - May 2015

- Tutored students about material and concepts taught in the class during my office hours
- Taught during the recitations
- Answered questions on Piazza
- Graded the assignments
- Created the autograder for the coding courses on Autolab

PROFESSIONAL ACTIVITIES

INSTITUTIONAL ACTIVITIES

GEORGIA INSTITUTE OF TECHNOLOGY
SCS Graduate Student Association Treasurer — Jan 2021 - Present
Grad Group Leader — Fall 2019 - Present
SCS PhD Visit Day Volunteer — Jan 2019, Mar 2020, Mar 2021
HackGT Mentor — Nov 2018, Nov 2019

CARNEGIE MELLON UNIVERSITY
Head Orientation Counselor — Mar 2016 - Aug 2016
Orientation Counselor — Aug 2014, Aug 2015
Student Academic Committee — Jan 2016 - May 2016

AWARDS/HONORS

INTERNAL AWARDS

CARNEGIE MELLON UNIVERSITY
Undergraduate Teaching in Computer Science Appreciation Award — May 2015, May 2017
Senior Student Leadership Award — May 2017

EXTERNAL AWARDS

CARNEGIEAPPS HACKATHON
EAA Award for Humanitarian Technology — Jan 2017
Best Technical Application — Jan 2015

PROJECTS

DYNAMIC DEPENDENCE GRAPH

- Built a LLVM application to create a graph showing both data dependence and control depndence
- Implemented based on approach 1 and 2 from Hiralal Agrawal and Joseph R. Horg's Dynamic Program Slicing paper
- Instrumented each function to check whether it got executed and piped it into the DG tool to create dependence graphs of only executed functions

RAPID RESPONSE

- Built a web application to provide information and place of attacks in rural countries to rescue workers
- Scraped information about attacks from social media and news websites using Beautiful Soup and Twitter's API
- Implemented using AngularJS and Django for frontend and backend respectively

KESA

- Built a web application to allow users to create and read stories with branching storylines
- Maintained the story as a D3 tree structure
- Created story sessions using PeerJS for authors to collaborate on these stories
- Implemented using AngularJS and Django for frontend and backend respectively

CONCURRENT DISTRIBUTED FILE SYSTEM

- Built a system containing multiple storage servers and the main naming server
- Implemented my own Java's Remote Method Invocation (RMI) library to allow communication between servers

SMART TEXT EDITOR

- Built a text editor web application in pure Javascript with basic functionalities
- Implemented a built-in thesaurus and Google Knowledge Base system into the editor to allow people to get information faster without leaving the editor

SKILLS

PROGRAMMING LANGUAGES

Python, C++, Javascript, OCaml, SML, Java, C, LaTeX, Processing, SQL

FRAMEWORKS/TOOLS

LLVM, Coq, Twelf, Celf, Django, AngularJS, Foundation, Bootstrap, MySQL, Git

LIBRARIES

Numpy, Pytorch, Scikit-Learn, Pandas, Tensorflow, PeerJS, jQuery, D3,

REFERENCES

SANTOSH PANDE (ADVISOR)

Professor, Georgia Institute of Technology
santosh.pande@cc.gatech.edu

GISELLE REIS

Assistant Teaching Professor, Carnegie Mellon University
giselle@cmu.edu

ILIANO CERVESATO

Teaching Professor, Carnegie Mellon University
iliano@cmu.edu