

Sharjeel Khan

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🎓 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

CONFERENCE PUBLICATIONS

BEACONS: A END-TO-END COMPILER FRAMEWORK FOR PREDICTING AND UTILIZING DYNAMIC LOOP CHARACTERISTICS

Girish Mururu, Sharjeel Khan, Bodhisatwa Chatterjee, Chao Chen, Chris Porter, Ada Gavrilovska, and Santosh Pande.

OOPSLA'23: ACM Object-Oriented Programming, Systems, Languages and Applications, Cascais, Portugal, 2023.

(Conditionally Accepted)

A HIGH PERFORMANCE COMPUTING ARCHITECTURE FOR REAL-TIME DIGITAL EMULATION OF RF INTERACTIONS
Mandovi Mukherjee, Nael Mizanur Rahman, Coleman DeLude, Joseph Driscoll, Uday Kamal, Jongseok Woo, Jamin Seo, Sudarshan Sharma, Xiangyu Mao, Payman Behnam, Sharjeel Khan, Daehyun Kim, Jianming Tong, Prachi Sinha, Santosh Pande, Tushar Krishna, Justin Romberg, Madhavan Swaminathan, and Saibal Mukhopadhyay.

RadarConf'23: 2023 IEEE Radar Conference, San Antonio, Texas, 2023.

[\[Paper\]](#)

DECKER: ATTACK SURFACE REDUCTION VIA ON-DEMAND CODE MAPPING

Chris Porter, Sharjeel Khan, and Santosh Pande.

ASPLOS'23: 28th ACM International Conference on Architectural Support for Programming Languages and Operating Systems, Vancouver, Canada, 2023.

[\[Paper\]](#) [\[Code\]](#) [\[Slides\]](#)

COM-CAS: EFFECTIVE CACHE APPORTIONING UNDER COMPILER GUIDANCE

Bodhisatwa Chatterjee, Sharjeel Khan, and Santosh Pande.

PACT'22: 31st International Conference on Parallel Architectures and Compilation Techniques, Chicago, IL, 2022.

[\[Paper\]](#) [\[Slides\]](#)

VICO : DEMAND-DRIVEN VERIFICATION FOR IMPROVING COMPILER OPTIMIZATIONS

Sharjeel Khan, Bodhisatwa Chatterjee, and Santosh Pande.

ICS'22: 36th ACM International Conference on Supercomputing, Virtual, 2022.

[\[Paper\]](#) [\[Slides\]](#)

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.

[\[Paper\]](#) [\[Code\]](#) [\[Slides\]](#)

ARXIV

PRACTICAL COMPILATION OF FEXPRS USING PARTIAL EVALUATION

Nathan Braswell, Sharjeel Khan, 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.

[\[Paper\]](#)

WORK EXPERIENCE

GRADUATE RESEARCH ASSISTANT

AUG 2018 – PRESENT

GEORGIA INSTITUTE OF TECHNOLOGY

Atlanta, Georgia

- Working with Santosh Pande on using program analysis to improve program verification techniques or solve security issues within codebases.

PHD SOFTWARE ENGINEER INTERN

MAY 2023 – PRESENT

GOOGLE

Mountain View, California

- Working on Android LLVM team to add order file functionality to Android applications for improved performance
- Tested order file's performance benefits on Android Runtime (ART)'s applications and Skia's applications

PHD SOFTWARE ENGINEER INTERN

MAY 2022 – AUG 2022

META

Menlo Park, California

- Worked on the PoGo Stick team to improve profile-guided basic block optimizations
- Implemented four basic block hit count schemes into Meta's Android Bytecode Optimizer, Redex
- Added basic block hit count profiles into PoGo Stick's pipeline to better optimize basic blocks for performance
- Made 21 commits to the open-source Redex repo

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 ENGINEER 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

CS4240: Compilers & Interpreters

Jan 2020 - May 2020

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

15-210: Parallel and Sequential Data Structures and Algorithms

21-241: Matrices and Linear Transformations

15-150: Principles of Functional Programming

15-122: Principles of Imperative Programming

Jan 2017 - May 2017

Jan 2017 - May 2017

Aug 2015 - Dec 2015

Aug 2015 - Dec 2015

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 President

SCS Graduate Student Association Treasurer

Grad Group Leader

SCS PhD Visit Day Volunteer

HackGT Mentor

May 2022 - Present

Jan 2021 - Apr 2022

Fall 2019 - Present

Fall 2019 - Present

Nov 2018, Nov 2019

CARNEGIE MELLON UNIVERSITY

Head Orientation Counselor

Orientation Counselor

Student Academic Committee

Mar 2016 - Aug 2016

Aug 2014, Aug 2015

Jan 2016 - May 2016

AWARDS/HONORS

INTERNAL AWARDS

CARNEGIE MELLON UNIVERSITY

Undergraduate Teaching in Computer Science Appreciation Award

Senior Student Leadership Award

May 2015, May 2017

May 2017

EXTERNAL AWARDS

CARNEGIEAPPS HACKATHON

EAA Award for Humanitarian Technology

Best Technical Application

Jan 2017

Jan 2015

PROJECTS

DYNAMIC DEPENDENCE GRAPH

- Built a LLVM application to create a graph showing both data dependence and control dependence
- 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
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ILIANO CERVESATO

TEACHING PROFESSOR, CARNEGIE MELLON UNIVERSITY
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