Seyed [Iman **Hosseini**] Zavaraki

PhD Candidate @ New York University

@ imanhosseini.17@gmail.com @ shz230@nyu.edu
https://imanhosseini.wordpress.com/
https://engineering.nyu.edu/student/iman-hosseini
https://github.com/ImanHosseini
@iman2_718

I have a wide range of interests. They include : HPC, performance, compilers, automated analysis & reverse engineering of software. Being a physics graduate & gold medalist in phyiscs olympiad, I have a solid background in mathematics. I am very enthusiastic about GPUs & have experience with CUDA, but also familiar with OpenCL, OpenGL & Vulkan [1] Most recently [2022], I spent the summer as intern at NVIDIA working on HPC compilers. I am proficient in OpenMP, OpenACC & MPI.
I am problem-driven & will wield any programming language, tool or theorem to solve problems. I have developed production code with C/C++ & Python, In the past I used to do a lot of Java too, my BS project was a transpiler from JVM bytecode to native ARM [2] as a co-processor (Java & Verilog). I have used typescript for using FRIDA, or making tools & a vscode extension I made as part of my work on neural decompilation. [3]

Education

2014-2019	**BS**, Computer Engineering, Sharif University of Technology, Iran
2015-2019	**BS**, Theoretical Physics, Sharif University of Technology, Iran
2022	**MS**, Computer Science, New York University, USA
2019-*	**PhD**, Computer Science, New York University, USA

Experience

2013-2019 — Instructor, Young Scholars Club & NODET High Schools, Iran
- Coaching Physics Olympiad contestants, Topics covered : Calculus, Linear Algebra, Analytical Mechanics, Perturbation Theory, Electrodynamics, Thermodynamics
- Devised theoretical & experimental questions for National Physics Olympiad exams

2015-2019 — Teaching Assistant, Sharif University of Technology, Iran
- Probability & Statistics course, graded quizzes, devised & graded the course project
- Secure Software Systems course, participated in assignment design & grading

2016-2019 — Research Assistant, Sharif University of Technology, Iran
- until 2018 : Sharif AI Lab, worked on complex systems & influence maximization
- 2018-2019 : Sharif S4Lab [a], worked on binary program analysis & instrumentation, contributed to S4Lab blog & talks

a. http://s4.ce.sharif.edu/

Summer 2017 — Computer Science Intern, University College Dublin, Ireland
Under supervision of Dr.Brett Becker, worked on implementing phenomD model of -graviational waves- in collaboration with Dr. John Regan from DCU

Summer 2018 — Software Developer Intern, Vispiron Systems, Germany
I was part of the Embedded CoC and worked on infrastructure and algorithms for an autonomous vehicle project. Designed & implemented a low-latency networking protocol to stream car data (LiDAR+Video). Also worked on software for thermal camera mounted inside the car.

1. https://github.com/osirislab/CSAW-CTF-2021-Finals/tree/main/rev/glootie
2. https://github.com/ImanHosseini/JAA
3. https://messlab.moyix.net/papers/btc_bar22.pdf

2018 Oct-Jan | **Software Developer Intern, Central Bank of Iran, Iran**
This counted as part of my credits for the Computer Engineering program. I worked on optimizing various .NET software for analysis of financial data & interoperability within .NET ecosystem using the CLR.

2019-* | **Research Assistant, NYU Center for Cybersecurity, USA**
Member of MESS Lab [a], a security lab focusing on Machine Learning, Embedded Systems, and Software/Systems Security.

a. https://messlab.moyix.net/

2019-* | **Lab Member, NYU OSIRIS Lab, USA**
The Offensive Security, Incident Response, and Internet Security Lab is a student-run cybersecurity research lab. It runs CSAW [a] CTF. I sometimes play CTFs with them, sometimes write blogposts. [b]

- 2020 : Authored challenges for CSAW'20 CTF [c]
- 2021 : Member of CSAW'21 Applied Research Program Committee, Authored challenges for the CTF [d]

a. https://csaw.io/
b. https://blog.osiris.cyber.nyu.edu/2019/12/11/OBIN-Binary_analysis/
c. https://blog.osiris.cyber.nyu.edu/2020/12/01/cuda-reversing/
d. https://github.com/osirislab/CSAW-CTF-2021-Finals/tree/main/rev/sfc

2022 May-Aug | **Compiler Developer Intern, NVIDIA Corporation, USA**
Part of HPC Compilers team. Worked on a performance feature for GPU offloading (investigation, design, implementation) which delivered enhancements in execution time across the board for all means of parallelism & all languages supported by NVHPC compilers. Made tools to help me in my work, which found use beyond my project. Also contributed to triaging & fix for a few bugs. Presented my work both internally & at company-wide intern poster session.

Grants, honors & awards

2011-2013	Passed 1st level examination of the annual National Physics, Computer, Mathematics & Astronomy Olympiads all 3 years of high school
2013	Gold Medal in the National Physics Olympiad
2013-2019	Member of the National (Iran) Elites Foundation
2014	Finished 7th in the selection examination for Iran's team at the International Physics Olympiad
2016	Finished 64th in the world (out of 2500 competing teams) in the IEEEXtreme programming contest (as Team SMI) - featured in national news
2019	Awarded NYU School of Engineering PhD Fellowship
2019,2022	Science Alliance Membership at New York Academy of Sciences (NYAS), sponsored by NYU
2020	Cybersecurity competition experience : Finished Praetorian Tech Challenges, Qualified for DARPA FETT CTF [a], scored 8 points in Fireye's Reverse Engineering competition (Flareon) [b]
2021	Finished 3rd in the A-HUG Hackaton [c], a week-long cloud Hackaton for Arm-based HPC systems hosted by AWS and Arm which involved porting and optimization of HPC applications for Arm Neoverse-N1 processors.
2022	Finished 2nd in DEFCON CTF finals in Las Vegas, as member of team Katzebin

a. https://www.darpa.mil/news-events/darpa-finding-exploits-to-thwart-tampering
b. https://www.mandiant.com/resources/blog/announcing-the-seventh-annual-flare-on-challenge
c. https://community.arm.com/arm-community-blogs/b/high-performance-computing-blog/posts/aws-arm-ahug-hpc-cloud-hackathon

Publications

1. Iman Hosseini and Brendan Dolan-Gavitt. Beyond the c : Retargetable decompilation using neural machine translation. *NDSS Workshop on Binary Analysis Research (BAR)*, Hybrid Event, San Diego, CA. 2022