Md Ali

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Integrity First • Always Loyal • Never Stop Learning

Summary

Md Ali is a self-starter, motivated individual who is a firm believer in continuously education. He is fluent in Russian, Bengali, and is currently learning Korean. His various research projects range from computer science, cybersecurity, physics, and mathematics. He is proficiently technical in many coding languages such as Java, Python, C++, R, MATLAB and FORTRAN. He is currenty doing research within the HExSA lab at Illinois Institute of Technology. He has been a graduate teaching assistant for one year in two separate graduate courses, Data Networks and Enterprise Server Admin. He is currently a Ph.D. student in Computer Science, has obtained an M.S. in Applied Cybersecurity and Digital Forensics, and also holds two B.S. in Physics and Applied Mathematics.

Work Experience

Doctoral Research Assistant – Illinois Institute of Technology August 2020 – Present
Chicago, IL

- Researching in the HExSA labs at Illinois Institute of Technology under the advisement of Dr. Kyle Hale. In the HExSA lab, the various research projects are in regards to distributed, parallel, and quantum computing.
- Researching a spectral analysis for the detection of malware inside software. This includes utilizing python and assembly code to detect irregulars within software dynamically to immediately expose malware.
- Leverage non-volatile main memory to perform to dynamic remote access memory as if it was the same memory storage. This research project resulted is that produced an effective runtime architecture. Ultimately, the findings of were that we were able to avoid the memory bandwidth between DRAM and CPU, also know as the von Neumann Bottleneck.
- Contributing micro benchmarks to an Areokernal called Nautilus. This is like a unikernel, except this is suited well for parallel run-times that need to have all the performance. This involved utilizing only thread implications that shared an address space, making this a single address space operating system. Currently, the development of the micro benchmarks are in hope to achieve heavy weight processes in the future for this Areokernal.

Graduate Researcher & Teaching Assistant – Illinois Institute of Technology August 2019 – July 2020
Chicago, IL

- Researched human trafficking and child predators that utilized encryption, stenography, and social engineering techniques to conduct their criminal activities under the advisement of Dr. Louis McHugh. This involved statistical analysis with many clear net and deep web pages that included hidden messages and computer forensics that are able to decrypt the encrypted drives.
- Conducted a mini research project into supply chain attacks, where he conducted a case study into the various methodology that make a supply chain attack successful. This required analyzing a number of major cyber breaches from Equifax, Target, and various ATMs in Eastern Europe.
- Teaching assistant for, "Data Networks and the Internet" that involved grading, evaluating, and lecturing during the Fall 2020 and Spring 2020. This role required to be technically proficient in network design, theory, and implementation. This included an in depth knowledge of various network topologies, TCP/UDP ports, and the OSI model.
- Teaching assistant for "Enterprise Server Admin" that involved grading, evaluating, and lecturing during the Spring of 2020. This role required him to be knowledgeable in Windows 2012/R2 servers. This included on how to set up, implementation, and troubleshoot the server.

Undergraduate Researcher & Lab Instructor – Texas State University May 2016 – May 2019
San Marcos, TX

- Mini research project utilizing C++ to theoretically calculate and model the decay of cube satellites in the atmosphere. This resulted in constructing a GUI interface to make the program user friendly. This included having weekly meetings to discuss about the project and current astrophysics phenomenons that may have any affect on the cube satellites.
- Laboratory instructor for introductory physics lab 1 and 2. This involved grading and lecturing about basic physics concepts in a hands on environment. This included concepts from mechanics to electrodynamics concepts.

Undergraduate Research Fellow – Early Universe, Cosmology, & Strings August 2016 – August 2018
San Marcos, TX

- Published a research paper regarding general relativist invariants of black holes, wormholes, and the Alcubierre metric. This involved analyzing FORTRAN code and converting the code into C++ and Python. This involved of hand calculation of tensors to confirm that we were receive the correct responses from the computer code. The publication included mathematical models and detailed proofs about the metric involved.
- Research regarding the investigation of negative probabilities and quasi-distribution. This involved heavily using R simulation specifically with the gold slit experiment. Quantum mechanics with R to statistically calculate the negative probability of a proton passing through both slits instead of one. The model was then showcased to a panel of research professor for approval in a independent research course where funding was given which was approved.

Publications

Curvature Invariants for the Accelerating Natario Warp Drive September 2020
Particles

- A process for using curvature invariants is applied to evaluate the accelerating Natário warp drive.
- Plotting various Ricci scalars and invariants. These plots had shown key features of the Natário warp bubble such as a flat harbor in the center of it, a dynamic wake, and the internal structures of the warp bubble.

Human Trafficking and the Internet July 2020
Illinois Institute of Technology

- Analyzed methodologies of encryption and stenography techniques used by human traffickers.
- Researched different methods of social engineering that the internet and other technology has introduced in human trafficking.
- Utilized statistical analysis to show case preventive measures to inform the community in order to lower the number of victims in human trafficking.

Curvature Invariants for Lorentzian Traversable Wormholes January 2020
Universe

- A process for using curvature invariants is applied as a new means to evaluate the traversability of Lorentzian wormholes and to display the wormhole space time manifold.
- Riemann tensor, Ricci tensor, Ricci scaler, trace free Ricci tensor, and Weyl tensor were all calculated by hand and with Python. Mathematically model the curvatures using Jupyter Notebook to compliment our findings.

Education

Illinois Institute of Technology • Chicago, IL August 2020 – Present
Doctor of Philosophy • Computer Science

Illinois Institute of Technology • Chicago, IL June 2019 – August 2020
Masters of Science • Applied Cybersecurity & Digital Forensics

Texas State University • San Marcos, TX August 2015 – May 2019
Bachelor of Science • Physics & Applied Mathematics

Achievements & Organizations

- Women in Cybersecuirty (WiCyS) Mentor 2020 – Illinois Institute of Technology
- IEEE Student Member 2020 – Illinois Institute of Technology
- CompTIA Student Member 2020 – Illinois Institute of Technology
- CyberHawk Security Member 2019 – Illinois Institute of Technology
- Sigma Pi Sigma Physics Nation Honor Society 2019 – Texas State University
- Society of Rheology 2019 – Texas State University
- Mathematical Association of America 2019 – Texas State University
- Mathematics Excellence Award 2019 – Texas State University
- Society of Physics Students 2015 – Texas State University