Islam Faisal

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Education

Sept 2019 – Present **Boston University**, *Boston*, Massachusetts, USA.
PhD in Computer Science
Dean's Fellow, Graduate School of Arts & Sciences

Sept 2019 – Present **Boston University**, *Boston*, Massachusetts, USA.
MS in Computer Science

June 2019 **The American University in Cairo**, *Cairo*, Egypt.
BSc *summa cum laude* (Highest Honors) – GPA: 3.93/4.00
Double Major in Computer Engineering and Mathematics
Awarded the Ahmed H. Zewail Medal for Excellence in the Sciences and Humanities

July 2013 **Kafr El-Zayat High School**, *Gharbeya*, Egypt. *99.76%*.
Top-Ranked Student Nationwide (1st of approx. 1/2 million students)

Academic Research Experience

Research in Pure Mathematics

2017 – 2018 **The American University in Cairo, Egypt**
Undergraduate Researcher, Mathematics Department
Supervisor: Dr. Mohammad Sadek
Topics: Number Theory; Elliptic Curves
- Surveyed different variants of the Diophantine Tuples;
- Defined a new variant and proved its non-existence;
- Parameterizing all possible $q \in Q$ for which a given non-zero rational triple $(x1, x2, x3)$ form a $D(q) - m-$tuple

Research in Computer Science and Applied Mathematics

Sep 2019 – Present **Boston University, Boston, MA, USA**
Doctoral Researcher, Department of Computer Science
- Defined different notions for leakage-resilient zero-knowledge in zero-knowledge proofs on secret-shared in the local and global leakage models;
- Showed a *local leakage resilience* property of an existing zero-knowledge proof system.

Sep – Dec 2018 **École polytechnique fédérale de Lausanne (EPFL), Switzerland**
Visiting Student, Decentralized and Distributed Systems (DEDIS) Lab
Supervisor: Prof. Bryan Ford
- Designing and implementing a fully-decentralized privacy-preserving machine learning system using blockchains, threshold cryptography, zero-knowledge proofs, secret-sharing, and multi-party computation;
- Preparing a preprint manuscript for submitting to publication;
- Participated in different team meetings and seminars

Jun – Aug 2017 **UCLA Institute for Pure and Applied Mathematics (IPAM), Los Angeles, CA, USA**
Undergraduate Researcher, Research in Industrial Projects for Students (RIPS)
Supervisor: Dr. Shantanu H. Joshi
- Worked in a team of four students on building a facial verification engine sponsored by **GumGum**, an applied computer vision company;
- Used a variety of mathematical concepts and machine learning tools including Tensorflow, Keras, and Torch;
- Presented the work in the Joint Mathematics Meetings (JMM) Conference

2016 – Present **The American University in Cairo, Egypt**
Undergraduate Researcher, Computer Science and Engineering Department
Supervisor: Prof. Sherif El-Kassas
Topics: Formal Methods; Security; Privacy
- Modeled some case studies on the symbolic analysis of voting protocols using the Tamarin prover;
- Worked on designing a limited proxying framework for content filtering that is published in LNCS

Jun – Aug 2014 **Center for Informatics Science, Nile University, Giza, Egypt**
Summer Trainee, Ubiquitous & Visual Computing Group
- Applied different machine learning topics including classification, clustering, feature selection and ensemble methods using Weka;
- Mentored a new intern and prepared a training manual for future interns

Peer-Reviewed Publications

Conference Papers

1 **Limited Proxying for Content Filtering Based on X.509 Proxy Certificate Profile**. Islam Faisal and Sherif El-Kassas. In *Proc. 11th International Conference on Security for Information Technology and Communications (SECITC 2018)*, LNCS, Bucharest, Romania, November 2018. Springer.

Other Research Manuscripts

Posters

2 **Case studies on the automated symbolic analysis of voting protocols**. Islam Faisal. In *AUC Undergraduate Research Exhibition*, Cairo, Egypt, May 2016.

3 **Convolutional neural networks and metric learning for facial verification**. Islam Faisal, Andrew Nguyen, Prem Talwai, Surabhi Desai, and Shantanu Joshi. In *Joint Mathematics Meetings Conference*, San Diego, USA, January 2018.

In Preparation

4 **Fully decentralized privacy-preserving machine learning framework**. Islam Faisal, Eleftherios Kokoris-Kogias, Bryan Ford, and Sherif El-Kassas.

5 **Transfer learning for emotion recognition from speech**. Taniya Mishra, Islam Faisal, and Mohamed Ezzeldin A. Elshaer.

Technical Reports

6 **Generating random, yet, constrained music**. Muhammad Faisal, Islam Faisal, and Islam Elgamal. Technical report, May 2017.

Industrial Experience

Summer 2019 & Fall 2017 **Twitter, San Francisco, CA, USA**
Software Engineering Intern, User Onboarding Backend Team
Mentor (Summer 2019): Christine Chen, PhD, UIUC
- Worked on calibration of account recommendations for new users between diversity and accuracy.
- Designed and launched an online experiment to A/B test the developed methods with millions of Twitter users.
- Participated in and co-organized reading groups on security and machine learning.

Mentor (Fall 2017): Yang Tang, MSc, Tsinghua University
- Trained and evaluated machine learning models for improving who-to-follow account recommendations in profile pages;
- Integrated and deployed ML models online for experimentation with a portion of production traffic;
- Participated in team code reviews, deploying and monitoring services, and resolving tech debts;
- Developed software in Scala and used Hadoop and Scalding

Jun – Aug 2018 **Twitter, Seattle, WA, USA**
Software Engineering Intern, Platform Security Team
Mentor: Scott Robinson, BS, MIT
- Built an analytics pipeline and visualization dashboard for content security policy (CSP) violation reports;
- Participated in team code reviews, deploying, and monitoring services;
- Participated and co-organized an internal security paper reading group;
- Developed software in Scala and used Hadoop and Scalding

Jan – Mar 2017 **Affectiva, Cairo, Egypt**
Machine Learning Intern – Speech, Science Team
Mentors: Taniya Mishra, PhD; Mohamed Ezz, MSc
- Worked directly with the lead speech scientist on emotion recognition from speech;
- Prototyped Affectiva's first multi-class speech emotion classifier;
- Employed transfer learning to adapt a deep Convolutional Neural Network (CNN) for the task of emotion recognition from speech

Jul – Aug 2015 **Microsoft Research, Cairo, Egypt**
Summer Intern Software Development Engineer (SDE), Speaker Recognition Team
Mentor: Motaz El-Saban, PhD
- Worked on Text-dependent Speaker Verification;
- Implemented the Hierarchical multi-Layer Acoustic Model (HiLAM) for speaker verification;
- Used a variety of speech processing toolkits and models such as HTK, Gaussian Mixture Modeling, MFCC feature extraction and voice activity detection;
- Used a mix of programming languages such as Matlab and C++

Selected Conferences and Competitions

Jan 2020 Attended two boot camps at the Simons Institute at UC Berkeley supported by Boston University:
- Lattices: Algorithms, Complexity, and Cryptography Boot Camp
- The Quantum Wave in Computing Boot Camp

Aug 2019 The 39th Annual International Cryptology Conference (CRYPTO 2019). *Santa Barbara, CA, USA.* Supported by Twitter to travel to the conference.

Aug 2019 28th USENIX Security Symposium. *Santa Clara, CA, USA.*
Gave a lightning talk about our ongoing work building a fully decentralized framework for machine learning.

Nov 2018 11th International Conference on Security for Information Technology and Communications (SECITC 2018). *Bucharest, Romania.*
Presented our paper "Limited Proxying for Content Filtering Based on X.509 Proxy Certificate Profile"

Aug 2018 Arithmetic Geometry, Number Theory, and Computation. *MIT, Cambridge, MA, USA.*

May 2018 The 13th Annual AUC Mathematics Competition. *Cairo, Egypt.*
Groups Round Winner

2017, 2018 The Annual Conference for Excellence in Undergraduate Research, Entrepreneurship and Creative Achievement (EURECA). *AUC, Cairo, Egypt.*

Jan 2018 Joint Mathematics Meetings (JMM). *San Diego, California, USA.*
- Supported by AUC and UCLA's IPAM to travel to the conference.
- Presented an oral presentation and a poster on our work on facial verification during the summer at IPAM.

Jul 2015 Black-Box Optimization Competition at the Genetic and Evolutionary Computation Conference (GECCO). *Madrid, Spain.*

Oct 2013 Intel Science Competition - Arab World 2013. *Amman, Jordan.*

Mar 2013 Intel Bibliotheca Alexandrina Science and Engineering Fair. *Alexandria, Egypt.*

Honors and Awards

2019 Dean's Fellowship, Graduate School of Arts & Sciences, Boston University

2019 ETH Zürich Direct Doctorate in Computer Science Scholarship (declined)

2019 École doctorale Informatique et Communications (EDIC) Fellowship, EPFL (declined)

2019 Graduated with *summa cum laude* (Highest Honors), The American University in Cairo

2019 Ahmed H. Zewail Medal for Excellence in the Sciences and Humanities, AUC's Centennial Graduation Commencement

2018 AUC Annual Mathematics Competition Groups Round 1st Place

2017 CSCE Exemplary Student

2013–2019 Dean's List for outstanding academic achievement

2013 Top Ranked Student Nationwide in High School (1^{st} of approx. 1/2 million students)

Mar 2013 Intel Excellence in Computer Science Award – Awarded by Intel Foundation at the Intel Bibliotheca Alexandrina Science and Engineering Fair

Grants

2015–2018 AUC University Undergraduate Research Travel Grants UG#1810898, UG#1711739, UG#1504427

2014 AUC University Undergraduate Research Mini Grant UG#1404292

2013–2019 University Public Schools Scholarship – Full-tuition undergraduate scholarship

Undergraduate Teaching

- Held tutorials and review sessions for the following courses;
- Helped students with questions or understanding the material during office hours;
- Wrote and graded an assignment for the Big Data Analytics course

Spring 2019 CSCE 4702 – Secure Systems Engineering

Winter 2018 CSCE 4910 – Big Data Analytics

Fall 2015 MACT 2131 – Discrete Mathematics

Spring 2015 MACT 2123 – Calculus III

Fall 2014 CSCE 2201 – Data Structures and Algorithms

Spring 2014 MACT 1122 – Calculus II

Spring 2014 CSCE 106 – Fundamentals of Computer Science

Academic Service & Extracurricular Activities

2019-2020 Mentoring a team of undergraduates working on a senior project on verifiable distributed computing.

Fall 2019 Organized the Quantum Cryptography Reading Group at Boston University

Spring 2018 Organized the AUC Security and Privacy Reading Group

2015 Arabic Managing Editor, The Insider AUC

2013, 2018 Academic Committee Member, Computer Science and Engineering Association

2011–2013 Founding Chair, KZ High School Tech-Club

References

- **Prof. Azer Bestavros**, Professor of Computer Science and Associate Provost for Computing and Data Sciences, Boston University.
- **Prof. Bryan Ford**, Head of Decentralized and Distributed Systems Lab (DEDIS), EPFL.
- **Dr. Christine Chen**, Senior ML Engineer, Twitter Inc. PhD, UIUC.
- **Prof. Leonid Reyzin**, Professor, Department of Computer Science, Boston University.
- **Dr. Mohammad Sadek**, Associate Professor, Sabancı University.
- **Dr. Shantanu Joshi**, Assistant Professor, Brain Mapping Center, UCLA.
- **Prof. Sherif El-Kassas**, Professor, Department of Computer Science and Engineering, American University in Cairo.
- **Prof. Susana Serna**, RIPS Program Director, Institute for Pure and Applied Mathematics (IPAM), UCLA.