Abdulrahman Diaa

📱 +1 (226) 698 6965 • ✉ a2diaa@uwaterloo.ca • 🌐 d-diaa.github.io

in abdulrahman-diaa-555300126 • ⌗ D-Diaa

Education

Graduate   **Ontario, Canada**
University of Waterloo – CrySP Lab   *Sept 2021 - Aug 2027*
PhD in Computer Science (Sept 2023 - Aug 2027) – **Ongoing**
MMath in Computer Science (Sept 2021 - Aug 2023) – **GPA: 96.75%**
Thesis: *Differentially-private multiparty Clustering*
Supervisor: Prof. Florian Kerschbaum

Undergraduate   **Cairo, Egypt**
The American University in Cairo   *Sept 2016 - June 2021*
Bsc in Mathematics (Sept 2017 - June 2021) – **GPA: 4.0/4.0**
Thesis: *Lattice-based Cryptography and Fully Homomorphic Encryption: A Survey*
Supervisor: Dr. Ahmed El-Guindy
Bsc in Computer Engineering (Sept 2016 - June 2021) – **GPA: 4.0/4.0**
Thesis: *Mixture of Experts for Human Activity Classification from Images*
Supervisors: Dr. Cherif Salama and Dr. Mohammed Moustafa

Publications and Preprints

[1] **A. Diaa**, T. Humphries, and F. Kerschbaum. *FastLloyd: Federated, Accurate, Secure, and Tunable k-Means Clustering with Differential Privacy*. 2024. arXiv: 2405.02437 [cs.CR].

[2] **A. Diaa** et al. "Fast and Private Inference of Deep Neural Networks by Co-designing Activation Functions". In: The 33rd USENIX Security Symposium. 2024.

[3] N. Lukas, **A. Diaa**, L. Fenaux, and F. Kerschbaum. "Leveraging Optimization for Adaptive Attacks on Image Watermarks". In: The 12th International Conference on Learning Representations. 2024.

[4] R. Mahdavi, **A. Diaa**, and F. Kerschbaum. *HE is all you need: Compressing FHE Ciphertexts using Additive HE*. 2023. arXiv: 2303.09043 [cs.CR].

[5] S. Sav, **A. Diaa**, A. Pyrgelis, JP. Bossuat, and JP. Hubaux. "Privacy-Preserving Federated Recurrent Neural Networks". In: The 23rd Privacy Enhancing Technologies Symposium. 2023.

Research Experience

Research Intern   **Lausanne, Switzerland**
École Polytechnique Fédérale de Lausanne – Lab for Data Security (LDS)   *July 2021 - Sept 2021*
Topic: Privacy-Preserving Federated Learning for Recurrent Neural Networks
Supervisor: Prof. Jean-Pierre Hubaux

Undergraduate Data Science Research Intern   **Cairo, Egypt**
Dell Technologies – Data Office Team   *Feb 2020 - June 2021*
Topics: Technology Forecasting and Distributed Neural Networks
Reference: Eng. Steve Todd (VP Data Innovation and Strategy)

Undergraduate Researcher   **Cairo, Egypt**
The American University in Cairo   *Sept 2019 - Jan 2020*
Topic: Deep Reinforcement Learning for Traffic Control
Supervisor: Dr. Cherif Salama

Research Software Development Engineering Intern   **Cairo, Egypt**
Microsoft Advanced Technology Lab in Cairo – Document Knowledge Extraction Team   *Jul 2019 - Sept 2019*
Topic: Schema-Inference from Semi-Structured Documents
Supervisor: Eng. Achraf Chalabi (Principal RSDE)

Awards

2021-2025: David R. Cheriton Graduate Scholarship - CA$40K *University of Waterloo*
2021-2023: International Masters Award of Excellence - CA$12.5K *University of Waterloo*
2021-2022: Johnston International Entrance Scholarship - CA$5K *University of Waterloo*
2016-2021: Tarek Nour Sponsorship (0.4%) - US$100K *Tarek Nour Communications*

Patents

Dell Technologies – Patent No: US 11934487B2 (Granted)
Splitting Neural Networks on Multiple Edge Devices to Train on Vertically Distributed Data *Mar 2024*
Dell Technologies – Application No: US 17/314315 (Pending)
Data-Driven Index for Identification and Ranking of Companies for a Selected Technology *May 2021*
Dell Technologies – Application No: US 17/237400 (Pending)
Market Basket Analysis for Infant Hybrid Technology Detection *Apr 2021*
Dell Technologies – Application No: US 17/160782 (Pending)
Forecasting Technology Phases Using Unsupervised Clustering with Wardley Maps *Jan 2021*

Honors

2021: President Cup *The American University in Cairo*
2016-2021: Dean's list of Academic Standing *The American University in Cairo*
2020: Challenge Coin for Innovation *Dell Technologies*
2019-2020: Finalist *Egyptian Collegiate Programming Contest*
2017: Best Interns Project *Microsoft EG Summer Internship*
2016: Best Player Cup *Geniuses (TV-Show), Season 1*

Project Highlights

Recent Advances on Foundation Models
Optimizing Adaptive Attacks Against Watermarked Language Models *Winter 2024*
Advanced Topics in Data Security and Privacy
On Adaptive and Automated Attacks for Adversarial Example Defenses *Winter 2022*
Reinforcement Learning
Multi-Agent Reinforcement Learning for Large-Scale Traffic Control *Winter 2022*
Introduction to Machine Learning
(Horizontally and Sequentially)-split Federated Recurrent Neural Networks *Fall 2021*
Fundamentals of Distributed Systems
Secure peer-to-peer image-sharing service with coherence guarantees and fault-tolerance on UDP *Fall 2019*
Computer Architecture
RV32IC-compliant CPU design with memory constraints and privileged instructions support *Fall 2018*

Skills

Languages: Python, GoLang, C++, C#, C, R, Verilog, SQL
Frameworks: Lattigo, CUDA, PyTorch, PySyft, OpenCV, ROS, SUMO, Arduino, QT, ASP.NET

Engineering Experience

Software Engineering Intern   **Cairo, Egypt**
Nokia EG   *Aug 2018 - Sept 2018*

Software Engineering Intern   **Cairo, Egypt**
Microsoft EG   *Jul 2017 - Aug 2017*

Teaching Experience

Teacher Assistant   **Cairo, Egypt**
The American University in Cairo   *Jan 2021 - June 2021*
Course: Embedded Systems Laboratory
Reference: Dr. Suzanne Safwat

Teacher Assistant   **Cairo, Egypt**
The American University in Cairo   *Sept 2020 - June 2021*
Course: Linear Algebra
Reference: Dr. Ahmed El-Guindy

Teacher Assistant   **Cairo, Egypt**
The American University in Cairo   *Sept 2017 - Jun 2019*
Course: Programming Fundamentals
Reference: Dr. Howaida Ismail

Other Roles

2018-2019: Student Technology Assistant   *C. of Learning & Teaching, The American University in Cairo*
2015-2017: A-Levels Teacher Assistant   *Al-Bashaer International Schools*

Extra-Curricular Activities

2017: Academic Vice-President   *Robotics Club, The American University in Cairo*
2017: ROV Control Engineer   *Robotics Club, The American University in Cairo*
2017: Robotics Instructor   *Robotics Club, The American University in Cairo*
2017: Content Editor   *Geniuses (TV Show)*
2016: Helped raise ~**4M USD** for public schools   *Geniuses (TV Show)*
2016: Geniuses (TV Show) Team Leader   *Al-Bashaer International Schools*