

# Abdulrahman Diao

☎ +1 (226) 698 6965 • ✉ a2diaa@uwaterloo.ca • 🌐 d-diao.github.io  
in abdulrahman-diao-555300126 • 🔄 D-Diao

## Education

### Graduate

University of Waterloo – CrySP Lab

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

**Ontario, Canada**

Sept 2021 - Aug 2027

### Undergraduate

The American University in Cairo

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

**Cairo, Egypt**

Sept 2016 - June 2021

## Publications and Preprints

- [1] **A. Diao**, 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. Diao** 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. Diao**, 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. Diao**, and F. Kerschbaum. *HE is all you need: Compressing FHE Ciphertexts using Additive HE*. 2023. arXiv: 2303.09043 [cs.CR].
- [5] S. Sav, **A. Diao**, A. Pyrgelis, JP. Bossuat, and JP. Hubaux. “Privacy-Preserving Federated Recurrent Neural Networks”. In: The 23rd Privacy Enhancing Technologies Symposium. 2023.

## 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

## Research Experience

---

<b>Research Intern</b> <i>École Polytechnique Fédérale de Lausanne – Lab for Data Security (LDS)</i> <b>Topic:</b> Privacy-Preserving Federated Learning for Recurrent Neural Networks <b>Supervisor:</b> <u>Prof. Jean-Pierre Hubaux</u>	<b>Lausanne, Switzerland</b> July 2021 - Sept 2021
<b>Undergraduate Data Science Research Intern</b> <i>Dell Technologies – Data Office Team</i> <b>Topics:</b> Technology Forecasting and Distributed Neural Networks <b>Reference:</b> <u>Eng. Steve Todd (VP Data Innovation and Strategy)</u>	<b>Cairo, Egypt</b> Feb 2020 - June 2021
<b>Undergraduate Researcher</b> <i>The American University in Cairo</i> <b>Topic:</b> Deep Reinforcement Learning for Traffic Control <b>Supervisor:</b> <u>Dr. Cherif Salama</u>	<b>Cairo, Egypt</b> Sept 2019 - Jan 2020
<b>Research Software Development Engineering Intern</b> <i>Microsoft Advanced Technology Lab in Cairo – Document Knowledge Extraction Team</i> <b>Topic:</b> Unsupervised Clustering for Schema-Inference from Semi-Structured Documents <b>Supervisor:</b> <u>Eng. Achraf Chalabi (Principal RSDE)</u>	<b>Cairo, Egypt</b> Jul 2019 - Sept 2019

## Honors

---

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

## Project Highlights

---

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

*Nokia EG*

**Cairo, Egypt**

*Aug 2018 - Sept 2018*

### Software Engineering Intern

*Microsoft EG*

**Cairo, Egypt**

*Jul 2017 - Aug 2017*

## Teaching Experience

---

### Teacher Assistant

*The American University in Cairo*

**Course:** Embedded Systems Laboratory

**Reference:** Dr. Suzanne Safwat

**Cairo, Egypt**

*Jan 2021 - June 2021*

### Teacher Assistant

*The American University in Cairo*

**Course:** Linear Algebra

**Reference:** Dr. Ahmed El-Guindy

**Cairo, Egypt**

*Sept 2020 - June 2021*

### Teacher Assistant

*The American University in Cairo*

**Course:** Programming Fundamentals

**Reference:** Dr. Howaida Ismail

**Cairo, Egypt**

*Sept 2017 - Jun 2019*

## 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*