Mohamed (Ayman) Attia

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🏛 EDUCATION

Purdue University, West Lafayette   Indiana, USA
Doctor of Philosophy (PhD), Physics   *Aug. 2024 - Present*
CGPA: 4.00/4.00

University of Science and Technology, Zewail City   Giza, Egypt
Bachelor of Science (B.Sc.), Physics with an Information Engineering Minor   *Aug. 2020 - Jul. 2024*
CGPA: 3.99/4.00
Awards: Class of 2024 Valedictorian, Dr. Ahmed Zewail Cup Recipient, Summa Cum Laude, Full-Funded Merit Scholarship
Graduation Thesis: Conformal Bootstrap

💼 EXPERIENCE

Graduate Teaching Assistant   *Aug. 2024 - Present*
Purdue University, West Lafayette   *Indiana, USA*

- I TA Modern Mechanics (PHYS 172) Laboratory.

- I TA-ed General Physics (PHYS 221) Recitation and Laboratory on Electricity, light, and modern physics.

- I TA-ed Modern Physics (PHYS 340) Laboratory.

Physics Junior Teaching Assistant   *Oct. 2021 - Apr. 2022*
University of Science and Technology, Zewail City   *Giza, Egypt*

- Facilitated problem solving sessions, both online and offline, to assist students in tackling challenging concepts in the Introduction to Classical Mechanics (PHYS 102) and Introduction to Modern Astrophysics (PEU 205) courses.

Back-End Developer   *Aug. 2022 - Sept. 2023*
BeauteKSA - Remotely   *Riyadh, Saudi Arabia*

- Maintained and enhanced the back-end architecture for a suite of 5 software products, ensuring reliability, scalability, and security.

- Streamlined the existing architecture to make it more maintainable and extendable, simplifying future development efforts.

- Identified and resolved performance bottlenecks, optimizing API response times from minutes to few seconds.

- Collaborated with cross-functional teams, especially front-end development team, to deliver over 50 new features and provided key input during project design, having a positive impact on the technical decision-making process.

Back-End Developer   *Aug. 2023 - Feb. 2024*
Insureship - Remotely   *Los Angeles, California, United States*

- Managed the upkeep of the company's back-end infrastructure and actively contributing to a holistic system overhaul.

✎ PROJECTS

Capstone Project: Sho95 Quantum Error Correction   *Mar. 2023 - Apr. 2023*
Implemented Quantum Error Correction algorithm using the Shor Code (sho95) to auto-correct bit and phase flips. Analyzed the outcomes using the state fidelity metric and investigated the impact of increasing error probabilities on the average fidelity and why that might be. Investigated and provided valuable insights into unexpected patterns observed in average fidelity.

Technologies: *Python, Qiskit*   ⬡ muhammed-ayman/Sho95-QEC-Code

Academic Project: Electric Circuits Simulator   *Dec. 2021 - Jan. 2022*
Engaged in a collaborative team of four students to develop a GUI application for electric circuit design and simulation. Incorporated software engineering principles and applied knowledge from electromagnetism.

Technologies: *C++ OOP, Factory Design Pattern* ⌂ muhammed-ayman/Electric-Circuits-Simulator

Academic Project: Genomic Analysis Tool (PySequence)   *Sep. 2021 - Oct. 2021*
Collaborated within a team of three students to create a GUI application specializing in comprehensive analyses of DNA and RNA strands. Integrated dynamic programming techniques to enhance analysis efficiency, incorporating various string metric analysis algorithms like Levenshtein distance.

Technologies: *Python, Dynamic Programming* ⌂ muhammed-ayman/PySequence

⚙ INTERNSHIPS & SCHOOLS

1st ArPS Summer School on Advanced Physics by *Arab Physical Society*   *Aug. 2023 - Sep. 2023*
A week of Advanced Physics lectures and seminars, covering QFT, General Relativity, Analytical Mechanics, and Statistical Mechanics.

3rd Summer School and Internship Programme at CTP by *The British University in Egypt*   *Jul. 2023 - Aug. 2023*
Two-week long physics program with lecture series and seminars on advanced topics such as QFT, Cosmology, Machine Learning in HEP, and Quantum Computation. Additionally, I worked on a project, supervised by Dr. Waleed El Hanafy, utilizing the GRTensor package in Maple to solve different GR problems.

Quantum Computing Workshop with IBM by *Qubit by Qubit*   *Sept. 2022 - Apr. 2023*
An 8-month, two-semester program taught by MIT and UC Berkeley researchers introducing students to quantum computing, including quantum mechanics, information, computation, and hardware, while connecting them with industry and academic experts and a global community of quantum enthusiasts.

Quantum Computing & Programming Workshop (QBronze94) by *Qiran*   *Aug. 2022 - Sept. 2022*

Alexandria Quantum Computing Winter School by *The Center of Excellence for Quantum Computers & Alexandria Quantum Computing Group*   *Feb. 2021*
A comprehensive program that aims to promote quantum computing awareness and education among university students, researchers, and professionals in Egypt, offering theoretical and practical sessions online, with international researchers sharing their expertise.

⚲ SKILLS & INTERESTS

Programming Languages: Python, C++, C, PHP, JavaScript, SQL

Technologies/Platforms: Mathematica, MATLAB, Qiskit, OriginLab, Git & GitHub, LaTeX

General: Data structures & algorithms analysis, Software Engineering and Design principles, Linux OS administration

👥 EXTRACURRICULAR ACTIVITIES

• The Arab Physical Society - Member

• Google Developer Student Club, Zewail City Chapter - Member

• 1st place winner project in The Egyptian Google Solution Challenge Hackathon 2022

• 2nd place winner project in Nile University Undergraduate Research Forum (UGRF) 2020 - School Projects Track