

# Mahmoud Abdelkader

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## Personal information

**Date of birth:** 22 Dec. 1997

**Citizenship:** Egyptian

## Education

Apr.2024 - Jun.2024 **Fully-funded internship**, *Heidelberg University*, Heidelberg, Germany. [Invited to Heidelberg University's HGS MathComp visiting program for a research project. Supervised by Dr. Michael Winckler. Stay scheduled for 6 weeks starting from April 21, 2024.](#)

Sep. 2023 - Jul. 2024 **Master's degree**, *University of Cape Town, AIMS*, Cape Town, South Africa **(Fully Funded Scholarship)**

Sep. 2022 - May 2023 **Pre Master**, *Helwan University*, Helwan, Egypt

2016 - 2020 **Bachelor of Science in Mathematics**, *Helwan University*, Helwan, Egypt  
**Total GPA =3.3/4.** Graduated with "very Good" (82.47%).

## Research Interests

### Optimization and Operational Research:

Feb.2024 - Jul.2024 My master's project title was "Mathematical Modelling and Implementation of Game Strategy for the Board Game Quoridor." This project involves developing and evaluating strategic algorithms, such as Minimax, Alpha-Beta Pruning, and Monte Carlo Tree Search, to master the game dynamics and optimize decision-making processes.

Mar. 2024 Participated in a 3-week workshop at AIMS South Africa during my master's program, focusing on linear and nonlinear optimization. Topics covered included optimality conditions, KKT conditions, constraint qualifications, and solution techniques.

2018 - 2019 Achieved excellent grades in an Operational Research (OR) course during my bachelor's degree at Helwan University, demonstrating a strong foundation in that field.

## Teaching and Mentoring Experience

Sep. 2024 - Present **Assistant Lecturer**, *Canadian International College "CIC"*, Part Time.

Sep. 2024 - Present **Assistant Lecturer**, *El-Gazeera Higher Institute for Engineering and Technology*, Cairo.

Oct. 2022 - Aug.2023 **Teaching Assistant**, *El-Gazeera Higher Institute for Engineering and Technology*, Cairo.

Sep. 2020 - Present **Freelance Mathematics lecturer**, *Online teaching*.

Sep. 2020 - Apr. 2021 **Teaching Assistant**, *Mathematics Dep., Faculty of Science, Helwan University, Helwan*.

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## Seminars & Schools

- 25-27 Oct. 2023 [Spring School "On Symmetries of Differential & Difference Equations and Their Applications"](#), Stellenbosch, South Africa
- 31 Aug. 2023 [Quadratic Forms, Rings and Codes](#), Laboratoire de Mathématiques de Lens, France
- 24-28 Jul. 2023 [Five days faculty development program on 'Data Analysis using Advanced Computational techniques'](#), Department of Statistics and Department of Mathematics, Amity University Kolkata, North India
- 27-28 Jan. 2023 [Categories, Rings and Modules, a conference in honor of Alberto Facchini](#), Online
- 10-21 Dec. 2022 [Rings, Algebras, and Category Towards Coding and Computer Algebras](#), CIMPA school, Helwan University
- 24 Jul. 2019 [Topology and its Applications](#), Helwan University.

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## Posters

- May. 2024 [Presented a research poster on 'Mathematical Modelling and Game Strategy for Quoridor' at After Research-Party, Heidelberg University](#).
- Mar. 2024 [Presented a research poster on 'Mathematical Modelling and Game Strategy for Quoridor' at Siyakhula event, AIMS South Africa](#).

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## Awards & Achievements

- Oct. 2023 [Mastercard Foundation Scholar for the academic year 2023-2024 at AIMS, Cape Town, South Africa](#).
- Jun. 2023 [Accepted for a fully fund scholarship to study Master's degree at University of Cape Town - Cape Town, South Africa](#)
- Dec. 2020 Seventh Place in the Ideal Student Competition at Helwan University.
- Dec. 2020 Ideal Student Certificate, Faculty of Science.

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## Memberships

- May. 2024 [Operation Research Society student member](#).
- Apr. 2024 [European Mathematical Society student member](#).

**Skills:**  $\text{\LaTeX}$ , C++, [Python](#), R software, CPLEX Software, Microsoft Office, GeoGebra, plotly, Canva, Emaze.

**Languages:** Arabic(native), English ([Upper Intermediate](#)), French (Basic).

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## Volunteer & Social works

- Mar. 2024 As a Mastercard Foundation Scholar, actively participated in community service initiatives, dedicating hours to social work and volunteering efforts. Engaged in educational tutoring at Muizenberg High, South Africa.
- Mar. 2024 [Volunteered at Siyakhula, an event by AIMS, to boost Africa's mathematical sciences](#).
- Dec. 2022 [Participated as a volunteer at CIMPA \(Algebra Winter School\), facilitating academic exchanges and supporting the organization of workshops focused on advancing algebraic knowledge and research collaboration among international scholars](#).

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## References

**Dr Karin-Therese Howell**

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Academic Director, African Institute for Mathematical Science, South Africa.

**Prof. Susan Eldeken**

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