

# Mahmoud Khaled

## Teaching Assistant

6 Melrose Road, Muizenberg Cape Town, South Africa.

+27 72 790 4408

✉ [mahmooudkh33@gmail.com](mailto:mahmooudkh33@gmail.com)

🌐 [sites.google.com/view/mahmoud-khaled/](https://sites.google.com/view/mahmoud-khaled/)

### Personal information

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

**Citizenship:** Egyptian

**Status:** Celibate

### Education

Sep. 2023 - Jul. 2024 **M.Sc.(Pursuing)**, *University of Cape Town, AIMS*, Cape Town, South Africa  
(Fully Funded Scholarship)

Sep. 2022 - May 2023 **Pre M.Sc.**, *Helwan University*, Helwan

2016 - 2020 **Bachelor of Science in Mathematics**, *Helwan University*, Helwan

**Total GPA = 3.3/4.** Graduated with "very Good" (82.47%).

Graduation \ Final year project: [Interval Analysis](#).

### Research Interests

#### Optimization and Operational Research:

Feb. 2024 - Now Currently working on my master's project titled "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 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, demonstrating a strong foundation in the field.

### Teaching and Mentoring Experience

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

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

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

### 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.

## Publication & 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.

## Awards & Achievements

- May. 2024 I have been accepted as an Operation Research Society student member.
- Apr. 2024 I have been accepted as a European Mathematical Society student member.
- Apr. 2024 Awarded a fully-funded internship at HGS MathComp, Heidelberg University, Germany. Conducted a 5-week research project in mathematical modelling and game strategy implementation for the board game Quoridor.
- Oct. 2023 Mastercard Foundation Scholar at AIMS: Empowering Africa's Future through Education, Leadership, and Community Impact - Cape Town, South Africa
- Aug. 2023 Accepted to study Master's degree at University of Cape Town - Cape Town, South Africa
- Jun. 2023 Selected for a fully fund scholarship to study Master's degree at University of Cape Town - Cape Town, South Africa
- Jun. 2023 Accepted to study Master 2 Indifférencié Modélisation et Méthodes Mathématiques en Economie et Finance. at Université Paris 1 Panthéon-Sorbonne - Paris, France
- May. 2023 Selected for the first stage in a fully fund scholarship from the French embassy in Egypt
- May. 2023 Selected for a fully fund scholarship to study Master's degree at Università della Calabria - Calabria, Italy
- Apr. 2023 Accepted to study Master 2 MPA at Université Côte d'Azur - Nice, France
- Dec. 2020 Seventh Place in the Ideal Student Competition at Helwan University.
- Dec. 2020 Ideal Student Certificate, Faculty of Science.

**Skills:**  $\text{\LaTeX}$ , C++, [Python](#), R software, Microsoft Office, GeoGebra, plotly, Canva, Emaze,  
**Languages:** Arabic(native), English (near-native), French (Basic).

## 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 and contributed to significant events like Siyakhula and the CIMPA Algebra Winter School, demonstrating a commitment to educational support and community development.
- Mar. 2024 Volunteered at Siyakhula, an event by AIMS, to boost Africa's mathematical sciences. Coordinated international workshops, talks, and showcases, fostering global scientific collaboration.

Dec. 2022 Participated as a volunteer at the 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**

e-mail: [howell@aims.ac.za](mailto:howell@aims.ac.za)

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

**Prof. Susan Eldeken**

e-mail: [Sfdeken@science.helwan.edu.eg](mailto:Sfdeken@science.helwan.edu.eg)

Mathematics Department, Helwan University, Cairo, Egypt.