

Youssef M. Hussein

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Education

University of Minnesota | Ph.D. in Computer Science

Sep 2023 -Present

- Conducting research in large language models and scalable data systems for spatiotemporal data management.
- Recipient of the Grants to Advance Graduate Education (**GAGE**) fellowship for the year 2023/2024

University of Minnesota | MS in Computer Science

Sept 2023 -Apr 2025

- Relevant Coursework: Advanced Database Systems, Operating Systems, Advanced Spatial Data Science.
- Projects: LLMs for Spatial Queries Analysis, Interactive and Scalable Data Management for Polar Science.

The American University in Cairo | B.Sc. in Computer Engineering

Sept 2018 -Jun 2023

- Thesis: Basant A., ... & **Hussein, Y.** (2023). GPU Accelerated Dataflow Analysis (unpublished manuscript).
- Placed on the Dean's Honorary List in Spring & Fall 2021, Spring & Fall 2022 & Spring 2023.
- Received a fully funded merit scholarship from the AGFE foundation with a 3.5% acceptance rate.

Selected Publications and Tutorials

- **Hussein, Y.**, Hemdan, M., & Mokbel, M. (2025). Large Language Models for Spatial Queries Analysis: A Tutorial. Proceedings of VLDB Conference 2025.
- Huang, Y., Uribe, A., **Hussein, Y.**, Eldahshoury, K., Ogren, G., & Mokbel, M. (2025). Polaris: An Interactive and Scalable Data Infrastructure for Polar Science [Scalable Data Science]. Proceedings of VLDB Conference 2025.
- Huang, Y., Uribe, **Hussein, Y.**, A., Ogren, G., Eldahshoury, K., & Mokbel, M. (2025). A Demo of POLARIS: An Interactive and Scalable Data Infrastructure for Polar Science [Demo]. Proceedings of VLDB Conference 2025.
- Hemdan, M., **Hussein, Y.**, & Mokbel, M. (2025). Large Language Models for Spatial Analysis Tasks. Proceedings of The 1st ACM SIGSPATIAL International Workshop on Urban Mobility Foundation Models (UMFM '25), 2025.
- **Hussein, Y.**, Hemdan, M., & Mokbel, M. (2025). Large Language Models for Urban Mobility: A Tutorial. Proceedings of the International Conference on Mobile Data Management (MDM).
- O. A. Hosny Sherif, ... A., & **Hussein, Y.** (2023). Economic Land Utilization Optimization Model. Sustainability, 15(3), 2594. <https://doi.org/10.3390/su15032594>
- Sakr, N., **Hussein, Y.**, & Farid, K. (2021). Dual-criticality scheduling on non-preemptive, dynamic processors using RL Agents. The Third International Workshop on Dynamic Scheduling Problems (pp. 57–62), , Poland.

Research Experience

Graduate Teaching Assistant | University of Minnesota

Feb 2025 – May 2025

- Teaching Assistant for CSCI 5708: Architecture and Implementation of Database Management Systems.
- Supported 50 students through office hours and project guidance on modifying PostgreSQL internals.

Graduate Research Assistant & Fellow | University of Minnesota

Sept 2023 – Present

- Kafy Project: Building an extensible LLM-based system for trajectory data using Python, TensorFlow, PyTorch, Hugging Face Transformers, and NumPy/Pandas, with support for geospatial processing via GeoPandas and H3.
- iHARP Project: Developed and demonstrated a live web portal (iharpv-dev.cs.umn.edu) for querying and visualizing raster data to support polar scientists using Python, Ract.js, and Django.

Research Engineer & Junior RA | The American University in Cairo

Sept 2019 – Jul 2021

- Led development of an embedded system integrating four subsystems to support sustainable land farming, enabling real-time agricultural data extraction & analysis using Python, NumPy/Pandas, BeautifulSoup, and VBA.

- Built and evaluated Reinforcement Learning models for dual-criticality scheduling problem using OpenAI Gym, RLlib, and TensorFlow, with supporting analysis in NumPy/Pandas and visualization in Matplotlib.

Industrial Experience

Software Engineer Co-op | Dell Technologies

Mar 2022 – Mar 2023

- Developed production-grade C++ modules for Dell's 5G platform, improving throughput and reliability in latency-sensitive environments.
- Worked with distributed teams (Egypt, India, Canada) to design and optimize server deployments, CI/CD pipelines, and gRPC-based microservices.
- Containerized 30+ services with Docker and Podman, reducing deployment time by 15% enhancing scalability.

Programming Fundamentals Mentor | Udacity Inc., Emeryville, CA

Sep 2022 – May 2024

- Mentored 300+ students (ages 12–17) in Python, data structures, and algorithms, applying 900+ teaching hours to strengthen programming fundamentals.

Software Engineer Intern | Silicon Arena LLC, Cairo, EG

Aug 2021 – Oct 2021

- Built front-end modules for an open-source Agile-based e-commerce platform using React.js and REST APIs
- Collaborated with back-end developers to ensure seamless database integration and data-driven UI components.

Certificates & Awards

- VLDB Travel Award Grant to attend the 2025 the Very Large Database conference (awarded to 12 students).
- GAGE Fellowship (2023 – 2024) – Grants to Advance Graduate Education, University of Minnesota
- Al-Ghurair Foundation Full Scholarship (2019 – 2023) – 3.5 % acceptance rate, AUC
- Dean's List, AUC – Fall 2021, Spring 2022, Fall 2022, Spring 2023
- 2nd Place, Economic Association Data Analysis Competition – Analyzed Egyptian Labor Market Survey.
- Google Cloud Qwiklabs ML Tracks (2021) – ML APIs, TensorFlow, BigQuery ML
- Coursera Certificates (2020 – 2021) – Intermediate Python, Intro to ML, TensorFlow Developer
- 1st Place, Single-Use Plastic Competition (2018) – Proposed campus plastic-reduction initiatives
- Regional Qualifier, Shell "Imagine The Future" Competition – Vision paper for Aswan City 2050

Skills

- Languages: C++, Python, VBA, MySQL, Shell Scripting
- Technologies: HuggingFace Transformers, Scrapy, TensorFlow, OpenAI Gym, RLlib, Google Cloud Platform

Leadership & Community Service

Board Member & Building Coordinators Chair | Como Student Community MN

Jul 2024 – Present

- Serving as liaison between residents and Co-op management through the Building Coordinators Committee, representing 13 buildings and 650+ residents

Founder & Organizer, Dell Learning Club | Dell Technologies

Apr 2022 – Present

- Co-ordinated a 4-person team to deliver monthly professional-development sessions across EMEA region (avg. 50 participants, 8+ countries)

Machine Learning Instructor | Google Developer Student Club, AUC

Aug 2021 – Dec 2021

- Introduced 40+ students to ML concepts, BigQuery, and Qwiklabs hands-on labs

Development Committee Member | AUC Student Union

Sep 2019 – Nov 2019

- Built SU website and integrated Twitter API using Anaconda, JavaScript, Node.js, Angular.js