# Sherif Mohamed Mostafa Mohamed Abdelrazek

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## 1. EDUCATION

- **School of Computer Science, Georgia Institute of Technology** — Atlanta, GA, USA
*PhD - Computer Science* — *August 2025 - Present*
Expected Date of Graduation: August 2030

- **Faculty of Engineering, Alexandria University** — Alexandria, Egypt
*Bachelor of Science - Computer and Systems Engineering* — *September 2016 - June 2021*
Excellent with Degree of Honour (95.38%) - ranked first

## 2. AWARDS

- **2024:** - Honorary mention in the 2024 IEEE ComSoc competition for ranking among the top 16 projects worldwide.
  - ACM Transactions on Spatial Algorithms and Systems (TSAS) invitation for Best Papers Special Issue.
  - Complimentary one-year ACM professional membership.
- **2023:** - ACM SIGSPATIAL 2023 Best Paper Runner-Up award.
  - ACM SIGSPATIAL 2023 travel grant.
- **2021:** - Professor Naim Aboutaleb award from the Faculty of Engineering, Alexandria University for ranking first.

## 3. RESEARCH AND WORK EXPERIENCE

- **Georgia Institute of Technology (Georgia Tech)** — Atlanta, GA, USA
*Graduate Research Assistant (part time)* — *August 2025 - Present*
  - **Research Lab and Advisor:** Networks Research Group; advised by Prof. Ahmed Saeed.
  - **Research Areas:** Scalable computer systems, datacenter resource management, scheduling, and overload control.

- **The American University in Cairo (AUC)** — Cairo, Egypt
*Researcher (full time)* — *March 2022 - August 2025*
  - **Supervisors:** Conducted research *jointly with Carnegie Mellon University (CMU)*, funded in part by CMU, under the supervision of Prof. Moustafa Youssef (AUC) and Prof. Khaled A. Harras (CMU).
  - **Research Areas:** Context-aware systems, mobile computing, and applied machine learning (ML) for smart environments.
  - **Main Technical Contributions:**
    * **ACM SIGSPATIAL 2023 Paper:** Designed a *data-centric lightweight* ML-based floor-level identification system using a CNN and only the serving cell tower signal strength as input (*accessible via standard Android and iOS APIs*). Improved accuracy by **3×** while reducing model size by **>10×**. Presented at the ACM SIGSPATIAL 2023 conference.
    **Implementation:** Developed an *Android app* for cellular signal data collection; integrated *Firebase* for multi-device data storage; and implemented ML training and inference pipelines in *Python (TensorFlow, Keras)*.
    * **ACM TSAS 2024 Paper:** Extended my floor identification system (SIGSPATIAL'23) by integrating *deep generative models* (*GANs* and *diffusion models*) to synthesize training data from few real-world signal samples. Reduced data collection effort by **70%** while maintaining accuracy. Published as an invited journal extension in ACM TSAS (2024).
    **Implementation:** Integrated GAN and diffusion models using *Python (TensorFlow, Keras)*.
    * **IEEE/ACM SEC 2024 Paper:** Proposed a novel floor-identification technique inspired by advances in *natural language processing* and *large language models (LLMs)*, adapting a state-of-the-art *BERT* model via *domain knowledge transfer* to process cellular signal data. Achieved **near-perfect** accuracy, approaching high-end technologies, while remaining suitable for consumer smartphones. Presented at the IEEE/ACM SEC 2024 conference.
    **Implementation:** Adapted the BERT encoder for cellular signal data and implemented training and inference pipelines in *Python (PyTorch)*.
    * **IEEE VTC2023-Spring & ACM SIGSPATIAL 2024 Papers:** Designed *multi-modal ML* systems for mobility analysis using cellular signal features. Combined automatic feature extraction (CNN-LSTM) with domain-specific hand-engineered features (processed using an MLP), exploring multiple feature fusion strategies. Achieved **23%** accuracy improvement over prior methods. Presented at IEEE VTC2023-Spring and ACM SIGSPATIAL 2024 conferences.
    **Implementation:** Developed an *Android app* for collecting cellular, inertial, and GPS data; integrated *Firebase* for multi-device data storage; and implemented ML training, feature fusion, and inference in *Python (TensorFlow, Keras)*.
    * **IEEE TVT 2024 Paper:** Extended my prior mobility analysis systems (VTC'23-Spring and SIGSPATIAL'24) by introducing a *domain adaptation* technique based on *denoising autoencoders (DAEs)*. This approach improves robustness against variations in data distribution caused by different phone placements and hardware heterogeneity (a common challenge in real-world deployments). The system enables high-accuracy mobility analysis even when trained on a single phone placement and device type, improving robustness to distribution shifts by **60%** over state-of-the-art methods. Published as a journal extension in IEEE TVT (2024).
    **Implementation:** Integrated the DAE into the training pipeline using *Python (TensorFlow, Keras)*.
    * **ACM SIGSPATIAL 2024 Paper:** Proposed a research vision on leveraging private *low Earth orbit (LEO) satellite networks* to complement GPS and enable truly ubiquitous global positioning. Highlighted potential benefits for coverage in challenging environments (e.g., indoors) and outlined key multi-disciplinary challenges that must be addressed to realize this vision responsibly. Presented at the ACM SIGSPATIAL 2024 conference.
    * **ACM SIGSPATIAL 2025 Paper:** Proposed the *Human-as-a-Sensor (HaaS) paradigm*, which envisions humans as intelligent multimodal sensing agents that complement traditional sensors. Leveraging advances in Brain-Computer Interfaces, HaaS extracts contextualized insights directly from brain signals. This vision opens opportunities for human-intelligence-augmented sensing and proactive spatial awareness, while also raising multidisciplinary challenges across computer science, neuroscience, and engineering. Presented at the ACM SIGSPATIAL 2025 conference.

- **Mentorship Experience:**
  * Mentored *six* undergraduate students from Alexandria University (jointly with Osaka University) and *two* from the American University in Cairo (jointly with the University of Waterloo) on research projects in context awareness and machine learning for 5G network simulation.
  * Guided the students in research methodologies, academic writing, and literature reviews, leading to *one paper accepted at IEEE WINCOM 2025 and two others under review at ACM SIGSPATIAL 2025.*

- **The American University in Cairo (AUC)** — Cairo, Egypt
  *Teaching Assistant (awarded per semester)* — *February 2022 - December 2024*
  - **Courses:** Advanced Machine Learning (CSCE 4604) and Computer Networks (CSCE 3312).
  - **Main Responsibilities:** Held office hours and discussion sessions; prepared and graded assignments including topics covering recent advancements such as *large language models (LLMs)*; guided students on practical course projects.

- **EJADA Systems Ltd.** — Alexandria, Egypt
  *Junior Software Developer (full time)* — *August 2021 - March 2022*
  - **Main Responsibilities:** Contributed to the development of large-scale software systems, including customer relationship management (CRM) platforms; (*Database*) Used *PL/SQL* for *Oracle database* management and control; (*Back End*) Used *Spring Boot* to create *RESTful APIs*; (*Front End*) Used *Angular* to build interactive forms and dynamic reports.
  - **Research-Driven Contribution:** Investigated and resolved performance bottlenecks in database transactions by applying *bulk processing* and *database indexing*. This optimization reduced the transaction time by more than an order of magnitude.

## 4. Research Publications

- **November 2025:** _Sherif Mostafa_, Khaled A. Harras, and Moustafa Youssef. 2025. Human-as-a-Sensor: Harnessing Brain Signals for Intelligent Multimodal Sensing in Spatially-Aware Systems. In the 33rd ACM International Conference on Advances in Geographic Information Systems (SIGSPATIAL '25). ACM, 5 pages. ***To appear.*** https://doi.org/10.1145/3748636.3760460.

- **August 2025:** _Sherif Mostafa_, Khaled A. Harras, and Moustafa Youssef. 2025. A Survey of Indoor Localization Systems in Multi-Floor Environments. IEEE Access 13, 146396-146432. https://doi.org/10.1109/ACCESS.2025.3599785.

- **December 2024:** _Sherif Mostafa_, Moustafa Youssef, and Khaled A. Harras. 2024. Ubiquitous and Low-Overhead Floor Identification with Limited Cellular Information. ACM Transactions on Spatial Algorithms and Systems (TSAS). Just Accepted. https://doi.org/10.1145/3708986 (*Invited for Special Issue on the Best Papers of the 2023 ACM SIGSPATIAL Conference*).

- **December 2024:** _Sherif Mostafa_, Moustafa Youssef, and Khaled A. Harras. 2024. Accurate and Ubiquitous Floor Identification at the Edge using a Single Cell Tower. In the Ninth IEEE/ACM Symposium on Edge Computing (SEC '24). IEEE, 206-219. https://doi.org/10.1109/SEC62691.2024.00024.

- **November 2024:** _Sherif Mostafa_, Moustafa Youssef, and Khaled A. Harras. 2024. ModeSense: Ubiquitous and Accurate Transportation Mode Detection using Serving Cell Tower Information. In the 32nd ACM International Conference on Advances in Geographic Information Systems (SIGSPATIAL '24). ACM, 184–195. https://doi.org/10.1145/3678717.3691250.

- **November 2024:** _Sherif Mostafa_, Mahmoud Elsanhoury, Jaakko Yliaho, Janne Koljonen, Heidi Kuusniemi, Mohammed El-musrati, Khaled A. Harras, and Moustafa Youssef. 2024. Vision: Leveraging Low Earth Orbit Satellites for Future Ubiquitous Positioning. In the 32nd ACM International Conference on Advances in Geographic Information Systems (SIGSPATIAL '24). ACM, 473–476. https://doi.org/10.1145/3678717.3691251.

- **September 2024:** _Sherif Mostafa_, Khaled A. Harras, and Moustafa Youssef. 2024. Robust and Ubiquitous Mobility Mode Estimation Using Limited Cellular Information. IEEE Transactions on Vehicular Technology (TVT) 74, 1, 1310-1321. https://doi.org/10.1109/TVT.2024.3454208.

- **December 2023:** _Sherif Mostafa_, Khaled A. Harras, and Moustafa Youssef. 2023. UniCellular: An Accurate and Ubiquitous Floor Identification System using Single Cell Tower Information. In the 31st ACM International Conference on Advances in Geographic Information Systems (SIGSPATIAL '23). ACM, Article 85, 1–10. https://doi.org/10.1145/3589132.3625635. (*Best Paper Runner-Up; <20% Acceptance Rate*).

- **June 2023:** _Sherif Mostafa_, Khaled A. Harras, and Moustafa Youssef. 2023. Ubiquitous Transportation Mode Estimation using Limited Cell Tower Information. In the 97th IEEE Vehicular Technology Conference (VTC2023-Spring). IEEE, 1-5. https://doi.org/10.1109/VTC2023-Spring57618.2023.10200431.

## 5. Professional Activities

- **Reviewer:** IEEE MDM 2025, IEEE MDM 2024, IEEE PerCom 2025, IEEE INFOCOM 2024, IEEE INFOCOM 2023, IEEE TMC, ACM TSAS, ACM MobiCom 2023.

- **Member:** IEEE Graduate Student Member (2024-2026), IEEE ComSoc Graduate Student Member (2024-2026), ACM Professional Member (2024-2025), ACM SIGSPATIAL Member (2023-2024).

- **Volunteer:** Student volunteer at ACM SIGSPATIAL 2023.

## 6. Technical Skills Summary

- **Languages:** Python, Java, C++, C, Matlab, R, Rust, SQL, PL/SQL, HTML, CSS, JavaScript
- **Frameworks:** TensorFlow, PyTorch, Keras, Angular, Spring Boot, Flask, Hibernate
- **Tools:** Git, LaTeX, gnuplot, Android Studio, Oracle SQL Developer, VMware Workstation, ns-3, Arduino IDE
- **Platforms:** Google Colab, Firebase, GCP, Microsoft Azure, Arduino, Web, Windows, Linux
- **Academic IELTS:** Listening (9.0), Reading (8.5), Writing (7.5), Speaking (8.0), Overall (8.5) — *August 2024*