Aymen Hamrouni

Nationality: Tunisian   **Date of birth:** 09/01/1996

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ABOUT ME

Aymen Hamrouni received his M.S. (Hons.) in Electrical and Computer Engineering from King Abdullah University of Science and Technology, Thuwal, Saudi Arabia, in 2023. Before that, he received his Diplome d'Ingénieur/B. Eng. (summa cum laude) in Telecommunication Engineering from the Ecole Superieure des Communications de Tunis (SUP'COM), Tunis, Tunisia, in 2019, and his CPGE degree in advanced theoretical mathematics and physics (Hons.) from Institut Preparatoire aux Etudes d'Ingénieur de Sfax, in 2016.

WORK EXPERIENCE

Ph.D. Researcher

Katholieke Universiteit Leuven [13/02/2024 – Current]

City: Leuven | **Country:** Belgium

Sabbatical Leave

NaN [03/02/2024 – 12/02/2024]

City: Leuven | **Country:** Belgium

- Role transition from KAUST to KU LEUVEN: pending my appointment at KU Leuven.

Graduate Researcher

King Abdullah University of Science and Technology (KAUST) [01/06/2023 – 02/02/2024]

City: Thuwal | **Country:** Saudi Arabia

-Worked on enabling dynamic routing for Low-Earth-Orbit (LEO) Satellites for enhanced IoT connectivity by using NLP models to predict the sequence of routes.

Founding Data Science Engineer/ Team Lead

Supermind Technology Inc. [01/10/2022 – 31/01/2023]

City: Remote (Thuwal) | **Country:** Saudi Arabia

-Founded and Led the Data Science department at Supermind Inc., a U.S.-based startup.
-Managed a team based in India, while working remotely from KSA, to tackle various cutting-edge problems around NLP applied for Web3 and Crypto markets.
-Designed NLP architectures and feed-forward pipelines to overcome training data scarcity and enable keyword extraction, sentence classification, semantic search, etc.

Research Scholar

Stevens Institute of Technology [01/02/2020 – 31/07/2021]

City: New Jersey | **Country:** United States

-Worked on enabling innovative Graph Neural Network techniques for service discovery and resource allocation in social IoT.

Research Intern

Stevens Institute of Technology [01/01/2019 – 04/12/2019]

City: New Jersey | **Country:** United States

-Enabled spatial and collaborative mobile crowdsourcing applications in smart cities and large-scale networks by means of optimization, graph theory, and deep learning techniques.

Big Data Intern

Aprico Consulting [01/07/2018 – 30/09/2018]

City: Sfax | **Country:** Tunisia

-Designed I-Monitor, a data analytic tool that provides actionable insights to take actions from several types of structured and unstructured log files.

EDUCATION AND TRAINING

Ph.D. in Electrical Engineering: Computer Science

Katholieke Universiteit Leuven [13/02/2024 – Current]

City: Leuven | **Country:** Belgium | **Website:** www.kuleuven.be

Masters

King Abdullah University of Science and Technology (KAUST) [01/08/2021 – 31/05/2023]

City: Thuwal | **Country:** Saudi Arabia | **Website:** www.kaust.edu.sa | **Field(s) of study:** Information and Communication Technologies | **Final grade:** 3.96/4 | **Thesis:** Socially Connected Internet-of-things Devices for Crowd Management Systems

-Pursuing M.S. in Electrical and Computer Engineering with minor in Computer Science
-Working on versatile computer vision projects including image quality assessment, artifact de-noising, and camera-based autonomous navigation systems

Diplome D'ingenieur

Higher School of Communication of Tunis (SUP'COM) [01/09/2016 – 31/01/2020]

City: Ariana | **Country:** Tunisia | **Website:** www.supcom.tn | **Field(s) of study:** Information and Communication Technologies | **Final grade:** Summa cum laude | **Thesis:** Spatial/Collaborative Mobile Crowdsourcing Framework for Event Reporting

-Bachelor of Engineering (Diplome D'ingenieur) in Telecommunication
-Minor in Computer Science
-Graduated with summa cum laude with the best graduation project at SUP'COM in 2020
-GRE Test Scores: Verbal: **142/170,** Quantitative**: 170/170,** and Analytical Writing: **3/6**

Diplome Classes Préparatoires Aux Grandes Ecoles

Sfax Preparatory Engineering School (IPEIS) [01/09/2014 – 31/05/2016]

City: Sfax | **Country:** Tunisia | **Website:** www.ipeis.rnu.tn | **Field(s) of study:** Natural sciences, mathematics and statistics

-CPGE Degree
-Intensive 2-year program of theoretical Math and Physics
-Ranked in the Top 100 nationwide

LANGUAGE SKILLS

Mother tongue(s): Arabic

Other language(s):

English (TOEFL 101)	**French**
LISTENING C2 **READING** C2 **WRITING** C2	**LISTENING** C1 **READING** C1 **WRITING** C1
SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1	**SPOKEN PRODUCTION** C1 **SPOKEN INTERACTION** C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Experience in MATLAB, python, and R / Communication and Signal Processing / C++ / C / Keras / Pytorch / Machine Learning / Graph Neural Networks / Algorithm Design / Optimization / Generative Modeling

PUBLICATIONS

[2023]
Graph Neural Networks for Vehicular Social Networks: Trends, Challenges, and Opportunities

E. Benshalfout, A. Hamrouni, and H. Ghazzai in IEEE Intelligent Transportation Systems

[2023]
Multi-Rotor UAVs in Crowd Management Systems: Opportunities and Challenges

A. Hamrouni, H. Ghazzai, and Y. Massoud in IEEE Internet-of-Things Magazine

[2022]
Context-Aware Service Discovery: Graph Techniques for IoT Network Learning and Socially Connected Objects

A. Hamrouni, A. Khanfor, H. Ghazzai, and Y. Massoud in IEEE Access

[2021]
Evolutionary Algorithms for 5G Multi-Tier Radio Access Network Planning

H. Ganame, L. Yingzhuang, A. Hamrouni, H. Ghazzai in IEEE Access

[2021]
Towards Collaborative Mobile Crowdsourcing

A. Hamrouni, H. Ghazzai, T. Alelyani, and Y. Massoud in IEEE Internet-of-Things Magazine

[2021]
Low-Complexity Recruitment for Collaborative Mobile Crowdsourcing Using Graph Neural Network

A. Hamrouni, H. Ghazzai, T. Alelyani, and Y. Massoud in IEEE Internet-of-Things Journal

[2020]
Many-to-Many Recruitment and Scheduling in Spatial Mobile Crowdsourcing

A. Hamrouni, H. Ghazzai, and Y. Massoud in IEEE Access

[2020]

A Spatial Mobile Crowdsourcing Frame- work for Event Reporting

A. Hamrouni, H. Ghazzai, M. Frikha, and Y. Massoud in IEEE Transactions on Compt. Social Systems

[2023]
V3Trans-Crowd: A Video-based Visual Transformer for Crowd Management Monitoring Best Paper Award, Saudi Arabia, 2023

A. Hamrouni, Y. Zuo, H. Ghazzai, and Y. Massoud in IEEE International Conf. on Smart Mobility

[2023]
Real-time Video Frame Denoising using Disentangled Generative Models: Rethinking the Image Deraining Process

A. Hamrouni, R. Hamadi, H. Ghazzai, and Y. Massoud in IEEE International Conf. on Smart Mobility

[2022]
Multi-modal Asymmetric Autoencoders for Massive Photo Collection Applications Student Travel Grant, China, 2022

A. Hamrouni, H. Ghazzai, and Y. Massoud in IEEE Asia Pacific Conference on Circuits and Systems

[2022]
Service Discovery in Social Internet of Things using Graph Neural Network

A. Hamrouni, A. Khanfor, H. Ghazzai, and Y. Massoud in IEEE Symposium on Circuits and Systems

[2020]
An Evolutionary Algorithm for Collab- orative Mobile Crowdsourcing Recruitment in Socially Connected IoT Systems

A. Hamrouni, H. Ghazzai, T. Alelyani, and Y. Massoud in IEEE Global Conf. on AI and IoT

[2020]
Optimal Team Recruitment Strategies for Collaborative Mobile Crowdsourcing Systems

A. Hamrouni, H. Ghazzai, T. Alelyani, and Y. Massoud in IEEE Tech. & Eng. Conference

[2020]
A Trustworthy Recruitment Process for Spatial Mobile Crowdsourcing in Large-scale Social IoT

A. Khanfor, A. Hamrouni, H. Ghazzai, Y. Yang, and Y. Massoud in IEEE Tech. & Eng. Conference

[2019]
Stochastic Team Formation Ap- proach for Collaborative Mobile Crowdsourcing

A. Hamrouni, H. Ghazzai, T. Alelyani, and Y. Massoud in Inter. Conference on Microelectronics

[2019]
Photo-Based Mobile Crowdsourcing Framework for Event Reporting

A. Hamrouni, H. Ghazzai, M. Frikha, and Y. Massoud in IEEE Symposium on Circuits and Systems

PROJECTS

[01/05/2021 – 30/04/2022]
Low-complexity Real-time Video De-noising of Corrupted Video Feed with Rain and Environmental Effects for Autonomous Vehicles (KAUST, 2022) -Created a low-latency video processing pipeline where videos captured by a low-quality camera equipped to the navigation systems of a device (e.g., UAV, autonomous vehicle) is cleaned from rain droplets and rainstreaks.

-Keywords: Generative Adversarial Networks (GANs), Continual Learning, Computer Vision, Auto- Encoders (AE), Optical Flow for motion estimation

[01/02/2020 – 30/06/2021]
Mobile Crowdsourcing Image-based Event Reporting System (Stevens Inst., 2021) -Designed two heuristic low-latency AI-powered redundancy filtering and quality check systems for captured images in Mobile Crowdsourcing frameworks.
-Keywords: NLP, Transformers, BERT, Auto-Encoders, Feature analysis, Clustering, Graph theory, Django, Rest API, OpenCV

HONOURS AND AWARDS

[01/09/2021] King Abdullah University of Science and Technology (KAUST),
Al-Khawarasmi Masters' Fellowship

[01/08/2021] Stevens Institute of Technology
Provost Fellowship

[01/08/2016] Higher School of Communication of Tunis (SUP'COM)
Excellence Scholarship

VOLUNTEERING

[01/08/2020 – Current]
IEEE Reviewer Reviewer in IEEE IoT Journal, IEEE Transactions on Computational Social Systems, IEEE Access, IEEE Internet Computing, and IEEE Communication Letters.

SERVICES

[01/05/2022]
KAUST Impact Acceleration Funding IAF 2022

Project: A Quality Filtering System for Massive Visual Data Collection Applications
· Total Funding: USD 100,000

· Period: August 2022 - July 2023

· Contribution: Contributing with preliminary results and in writing the proposal