AYMEN HAMROUNI

AI Researcher, Deep Learning and Algorithm Design, M.Sc. @ KAUST
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Aymen Hamrouni* received the Diplome d'Ingenieur (*summa cum laude*) in Telecommunication Engineering from the Ecole Superieure des Communications de Tunis (SUP'COM), Tunis, Tunisia, in 2019. Before that, he recieved his CPGE degree in advanced theoretical mathematics and physics (*Hons.*) from Institut Préparatoire aux Etudes d'Ingénieur de Sfax, in 2016. Aymen is a young, passionate, and self-motivated AI researcher with a versatile background in Information Technologies and equipped with thorough mathematical **Optimization** knowledge, **Graph Theory** expertise, and advanced **Data Science** skills. Fluent in Python, C/C++, and Matlab, Aymen's interests* lay in the intersection of graph neural networks, deep generative modelings, applied machine learning and optimization, mathematical modeling, graph theory, and the Internet-of-Things. Aymen is currently serving as an active reviewer in IEEE IoT Journal, IEEE TCSS, IEEE Access, and IEEE Communication Letters. During the period from 2019 to 2021, Aymen was affiliated as a Junior Research Scientist with Stevens Institute of Technology. He has managed, till now, to produce more than 10 state-of-the-art papers including journals, conferences, and magazines in various top IEEE venues.

EDUCATION

King Abdullah University of Science and Technology (KAUST) *December 2022*
Ivy League University

Currently pursuing M.Sc. in Electrical and Computer Engineering
Minor in Computer Science
Affiliated with Innovative Technologies Laboratories*
Designing hybrid generative models (e.g., mixed hierarchical convolutional auto-encoders) for image quality assessment and artifact de-noising

Higher School of Communication of Tunis (SUP'COM) *January 2019*
B. Eng. in Telecommunication
Minor in Computer Science
Graduated with Honors *(summa cum laude)* with the best graduation project in 2020
Overall GPA: 17/20

Sfax Preparatory Engineering School (IPEIS) *May 2016*
French CPGE Degree
Intensive 2-year program of theoretical Math and Physics
Obtained the preparatory diploma with flying colors and ranked among 5% national wide in the National Entrance Contests for Engineer Training Cycle in Tunisia

EXPERIENCE

Stevens Institute of Technology October 2020 - July 2021
Junior Research Scientist *Hoboken, NJ, USA*

- Designed low-complexity meta-heuristic algorithms for team formation and recruitment in collaborative mobile crowdsoucing using social Internet-of-Things networks
- Worked on enabling innovative Graph Neural Network techniques for service discovery in social IoT
  Key-words: Particle Swarm Optimization, Genetic algorithm, Graph embedding, Graph Neural Network, Approximation algorithms

Stevens Institute of Technology January 2019 - September 2020
Research Intern/Scholar *Hoboken, NJ, USA*

· Applied optimization, graph theory, and deep learning techniques to enable spatial and collaborative mobile crowdsourcing applications in smart cities
Key-words: Mixed/Integer Linear Programming, Local search, Meta-heuristic, Bipartite Graph, Dynamic Programming, Greedy Algorithms, Constrained Programming

Aprico Consulting June 2018 - September 2018
*Big Data Intern** *Sfax, Tunisia*

· Designed I-Monitor, a data analytic tool that provides actionable insights from several types of structured and unstructured log files
Key-words: Kibana, Elasticsearch, Java, Rest API, Talend, Batch, Scrum

PROFESSIONAL AND ACADEMIC PROJECTS

• Crowdsourcing Photo-based Event Reporting
Designed a mobile crowdsourcing framework for event reporting where users uses their smartphone to collect photos of ongoing events and upload them to the server. The collected data goes through redundancy filtering and quality check using machine learning techniques and graph analysis tools
Keywords: Convolutional Neural Networks, Django, Feature extraction, Rest API, OpenCV

• IoT Agro Environnemental
Was part of a team that designed a smart IoT application relying on wireless sensor network for data acquisition and control for agriculture irrigation
Keywords: Zolertia, Contiki, Node-RED, 6loWPAN, Raspberry Pi 2, MySQL, C, 6LBR, RPL.

• Smart Home Security*
Designed a Smart Home hybrid mobile application that enables distant control (e.g., Windows) and monitor the security status at home
Keywords: Node.JS, Ionic, SSL/TLS, Corodova, Socket.io, MongoDB, REST, JWT, MQTT

• Smart-Phone Indoor/Outdoor Localization System
Designed a localization system which uses the images captured by the mobile of the user and gives the latter the ability to determine his/her position and to navigate even in GPS dead zones using image feature matching
Keywords: Machine Learning, SIG, Django, AngularJs, Cordova, Xamarin, XML, JavaScript

• Student Guide
Worked on an android application called "Student Guide" that facilitates student's life by giving them access to several features such as filling administrative forms, creating their private online club chat and accessing their marks
Keywords: Web Scrapping, HTTPs, MySQL, Android Studio, Hashing, Google APIs

SIDE STRENGTHS

Programming Languages	Python, C, C++, Java, Matlab
Protocols & APIs	XML, JSON, SOAP, REST
Databases	MySQL, Elasticsearch, MongoDB
Vanilla Python ML Libraries	TensorFlow, Pytorch, Keras, Pandas, OpenCV, Numpy
Languages	Arabic (Native), English (A), French (B^+)
Academic Certificates	CCNA 1, 2 and 3, TOEFL(101/120)*, GRE(312/3)*
Professional Certificates	Discrete Optimization, Deep Learning, CNN & and NNs

RESEARCH PUBLICATIONS

1. **A. Hamrouni**, H. Ghazzai, and Y. Massoud, "V3Trans-Crowd: A Video-based Visual Transformer for Crowd Management Monitoring," [**Pending Review**].
2. **A. Hamrouni**, H. Ghazzai, and Y. Massoud, " Multi-modal Asymmetric Autoencoders for Massive Photo Collection Applications," [**Pending Review**].
3. **A. Hamrouni**, H. Ghazzai, and Y. Massoud, "Generative Adversarial Networks for de-noising Images Corrupted with Environmental Effects," [**Pending Review**].
4. **A. Hamrouni**, H. Ghazzai, and Y. Massoud, "Resource Allocation in Social IoT using Graph Neural Networks," [**Pending Review**].
5. **A. Hamrouni**, H. Ghazzai, and Y. Massoud, "Graph Neural Networks for Service Discovery and Navigability in Social Internet-of-Things: Opportunities and Challenges," [**Pending Review**].
6. **A. Hamrouni**, A. Khanfor, H. Ghazzai, and Y. Massoud, "A Graph Neural Network Approach for Large-scale Service Discovery using Social Internet-of-Things," [**Pending Review**].
7. **A. Hamrouni**, H. Ghazzai, Y. Massoud, H. Menouar, and F. Salim, "Unmanned Aerial Vehicles in Crowd Management Systems: Opportunities and Challenges" [**Pending Review**].
8. H. Ganame, L. Yingzhuang, **A. Hamrouni**, H. Ghazzai, "Evolutionary Algorithms for 5G Multi-Tier Radio Access Network Planning," in IEEE Access, 2021.
9. **A. Hamrouni**, H. Ghazzai, T. Alelyani, and Y. Massoud, "Towards Collaborative Mobile Crowdsourcing," in IEEE Internet-of-Things Magazine (IoT- M), 2021.
10. **A. Hamrouni**, H. Ghazzai, T. Alelyani, and Y. Massoud, "Low-Complexity Recruitment for Collaborative Mobile Crowdsourcing Using Graph Neural Networks," in IEEE Internet-of-Things (IoT), 2021.
11. **A. Hamrouni**, H. Ghazzai, T. Alelyani, and Y. Massoud, "An Evolutionary Algorithm for Collaborative Mobile Crowdsourcing Recruitment in Socially Connected IoT Systems," 2020 IEEE Global Conference on Artificial Intelligence and Internet of Things (GCAIoT), Dubai, UAE, 2020.
12. **A. Hamrouni**, H. Ghazzai, T. Alelyani, and Y. Massoud, "Optimal Team Recruitment Strategies for Collaborative Mobile Crowdsourcing Systems," 2020 IEEE Technology Engineering Management Conference (TEMSCON), Novi, MI, USA, 2020.
13. A. Khanfor, **A. Hamrouni**, H. Ghazzai, Y. Yang, and Y. Massoud, "A Trustworthy Recruitment Process for Spatial Mobile Crowdsourcing in Large-scale Social IoT," 2020 IEEE Technology Engineering Management Conference (TEMSCON), Novi, MI, USA, 2020.
14. **A. Hamrouni**, H. Ghazzai, and Y. Massoud, "Many-to-Many Recruitment and Scheduling in Spatial Mobile Crowdsourcing," in IEEE Access, 2020.
15. **A. Hamrouni**, H. Ghazzai, M. Frikha, and Y. Massoud, "A Spatial Mobile Crowdsourcing Framework for Event Reporting," in IEEE Transactions on Computational Social Systems, April 2020

16. **A. Hamrouni**, H. Ghazzai, T. Alelyani, and Y. Massoud, "A Stochastic Team Formation Approach for Collaborative Mobile Crowdsourcing," 2019 31st International Conference on Microelectronics (ICM), Cairo, Egypt, 2019.
17. **A. Hamrouni**, H. Ghazzai, M. Frikha, and Y. Massoud, "A Photo-Based Mobile Crowdsourcing Framework for Event Reporting," 2019 IEEE 62nd International Midwest Symposium on Circuits and Systems (MWSCAS), Dallas, TX, USA, 2019.

HONORS AND AWARDS

- Best Dissertation Award, Higher School of Communication of Tunis (SUP'COM), January, 2020
- Provost Fellowship, Stevens Institute of Technology, August, 2021
- Excellence Scholarship, Higher School of Communication of Tunis (SUP'COM), August, 2016