

Reda El Marhouch

Ph.D. Student in Artificial Intelligence

Research Interests: Multi-Agent Reinforcement Learning,

Graph-based Communication, Heterogeneous Swarm Coordination

Rabat

Morocco

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Education

- 2022 – Present **Ph.D. Student in Artificial Intelligence**, *Reinforcement learning for collaborative heterogeneous swarms in partially known environments*, at Ai Movement, UM6P - University Mohammed VI Polytechnic, Rabat, Morocco.
- 2018 – 2021 **Diploma of State Engineer in Data and Knowledge**, School of Information Sciences ESI, Rabat, Morocco.
- 2015 – 2018 **Engineering Preparatory classes (CPGE)**, *Physics and Engineering sciences (PSI)*, Moulay Lhassan High School, Tangier, Morocco.
- 2014 – 2015 **Baccalaureate Degree**, *Biology with first-class honours*, Ibn Zohr High School, Ouezzane, Morocco.

Work Experience

- March 2021 **AI Engineer Intern - Ai Movement, Rabat.**
- July 2021 Implementation of an integrated management and monitoring system for smart parkings in Morocco: Approach based on Computer Vision and Deep Learning
- Design and implementation of Moroccan license plate detection and recognition models.
 - Implementation of a real-time vision-based vacancy detection model.
 - Development of a platform with management modules.
- June 2020 **Data Science Intern - Dial Technologies, Casablanca.**
- August 2020 Design and implementation of an intelligent voice assistant for insurance customer service
- Design of different conversational flows for insurance customer service.
 - Design and implementation of an autonomous intelligent voice assistant.
 - Integration into various messaging platforms with text/voice Input & Output.

Publications

In Conference Proceedings

- 2026 **Reda El Marhouch**, Salah Chegri, Btissam El Khamlichi, and Amal El Fallah Seghrouchni. Connectivity-influence weighting: A structural bias for graph-based marl. In *2026 IEEE 23rd Consumer Communications & Networking Conference (CCNC)*, pages 1–6, 2026.
- 2025 **Reda El Marhouch**, Btissam El Khamlichi, and Amal El Fallah Seghrouchni. Learning-based distributed aerial herding of ugv swarms. In *2025 21st International Conference on Distributed Computing in Smart Systems and the Internet of Things (DCOSS-IoT)*, pages 93–98, 2025.

Journal Article (In Press)

- 2026 **Reda El Marhouch**, Btissam El Khamlichi, and Amal El Fallah Seghrouchni, ASAP: Adaptive Structural Attention Priors for Scalable Graph-Transformer Multi-Agent Reinforcement Learning.

In Conference Proceedings (In Press)

- 2026 Fadoua Ait Ayane, **Reda El Marhouch**, Btissam El Khamlichi, and Amal El Fallah Seghrouchni, LI-MA2E: Learning-Informed Masking for Multi-Agent Reinforcement Learning in Partially Observable Environments.
- 2026 Salah Chegri, **Reda El Marhouch**, Btissam El Khamlichi, and Amal El Fallah Seghrouchni, Decoupled-Topological Structural Bias for Graph-Based MARL.

Talk & discussion

- IJCAI-ECAI Vienna 2022 **AI Diversity and Inclusion for Africa (AIDIA) Seminar:** Advocated for inclusive AI solutions accessible to all, emphasizing the needs of communities in Africa. Presented on "AI for Good: Collaborative Heterogeneous Swarms in Partially Known Settings," demonstrating MARL's potential in search and rescue operations and disaster assessment.
- IJCAI Montreal 2021 **Diversity and Inclusion in AI Forum :** Shared insights from my internship project at Ai Movement, focusing on the "Implementation of an Integrated Management and Monitoring System for Smart Parking Lots in Morocco," utilizing Computer Vision and Deep Learning. Highlighted the essential role of diversity and inclusion in advancing AI technologies for societal benefits.

Volunteering & Grants

- IJCAI 2021 **Volunteered as an Auditorium Monitor:** Moderated Q&As during plenary sessions and received a grant for full conference access, including workshops and tutorials.
- ICSSD Rabat 2021 **Junior Committee Volunteer:** Assisted with slides preparation, task completion, and workload management for the International Conference on Smart Systems and Data Science.

Computer skills

- Programming Python, PyTorch, TensorFlow, R, Java
- Sim. & Modeling ROS2, Gazebo, PyBullet, UML, SysML, Merise, Protégé (Ontologies).

Teaching Assistantship

- 2022 - 2025 **Introduction to AI, Robotics & Scratch Programming,** *Master Junior Program*, Ai Movement, UM6P, 33h.
- 2025 **Python for Data Science & AI,** *Executive Training (AI Governance & Practices)*, Ai Movement, UM6P, 3h.
- 2025 **Hands-on RL: Q-Learning, SARSA, and Deep RL,** *Executive Training (AI4MINE)*, Ai Movement, UM6P, 3h.

Languages

Arabic: native

French: fluent

English: fluent

Referees

Amal El Fallah Seghrouchni, Ph.D.

*Full Professor, exceptional class,
at Sorbonne University, Paris, France
Head of Multi-Agent System
Group (SMA) at LIP6
Member of the COMEST - UNESCO
✉ Amal.ElFallah-Seghrouchni@um6p.ma*

Btissam El Khamlichi, Ph.D.

*General Director at Ai Movement
Head of Swarm Intelligence Team
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