

OTHMANE ECHCHABI

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EDUCATION

McGill University & Mila — Quebec AI Institute, Montréal, Canada

M.Sc. in Computer Science (Thesis, fully funded) — Expected 05/27

- Research Assistant in Rolnick Lab, focus on Machine Learning, Computer Vision, Climate & Sustainability

Duke Kunshan University / Duke University, Kunshan, China / Durham, USA

B.Sc. in Data Science (Dual Degree) — 05/25

- Thesis: Monitoring Spartina Alterniflora Using Self-Supervised Learning (funded by DKU Research Grant). [\[poster\]](#)
- Study Abroad: Universidad Carlos III de Madrid (01/2022–05/2022)

GRANTS AND AWARDS

McGill CS Graduate Award — \$30,000/year (2025)

McGill CS Graduate Registration Bonus — \$5,000 (2025)

DKU Student Experiential Learning Fellowship — \$1,000 (2024)

DKU Signature Work Research Grant — \$1,500 (2023)

DKU iINNOVATION iNCUBATOR — \$3,000 (2023)

RESEARCH EXPERIENCE

Graduate Research Assistant

University Mohammed VI Polytechnic, Benguerir, Morocco

Supervisor: Prof. Ismail Berrada

Jun 2025 – Present

- Built a global dataset integrating a decade of crop yield and fertilizer data.
- Created a pipeline for field fertilizer recommendations using a custom transformer model
- Created an agentic AI tool with an integrated Large Language Model and Retrieval Augmented Generation.

Research Assistant

Duke Kunshan University, Suzhou, China

Supervisor: Prof. Ka Leung Lam

Jun 2024 – Present

- Created a global dataset of piped water and sewage access, leveraging satellite imagery and ViT's (97% accuracy).
- Advanced SDG6 monitoring capacity by providing scalable, ML-driven infrastructure assessments for African nations.

Supervisor: Prof. Charles Chang

Jun 2024 – Present

- Designed a Transformer model achieving 94% accuracy in transport mode prediction, 92% in trip purpose inference.
- Deployed CarbonClever, a social platform promoting individual carbon footprint reduction through mobility insights.

Research Assistant

University of Missouri, Columbia, MO

Supervisor: Prof. Jordan Malof

Jan 2025 – Jun 2025

- Worked on building a foundation model using Perceiver IO for wildfire spread prediction using satellite and climate data to capture spatiotemporal fire dynamics.
- Developed a Variational Autoencoder (VAE) as a generative model to simulate wildfire propagation, improving understanding of spread patterns under varying conditions.

Research Fellow

Duke University, Durham, NC

Supervisors: Prof. Wenhong Li & Prof. Ding Ma

Jun 2024 - Aug 2024

- Applied Vision Transformers on Sentinel-2 & Landsat imagery to detect invasive salt marsh species at landscape scale.
- Findings presented at the Duke Climate+ Symposium (2024), supporting coastal wetland conservation policy.

Supervisor: Prof. Emily Bernhardt

Jun 2023 - Aug 2023

- Developed a geospatial database of saltwater intrusion & sea level rise in the North American Coastal Plain.
- Applied NLP (BERT) on 1,000+ articles to extract trends; delivered insights via an interactive ArcGIS platform.

PUBLICATIONS AND PREPRINTS

- **O. Echchabi**, A. Lahlou, N. Talty, J. Manto, K. L. Lam. Tracking Progress Towards Sustainable Development Goal 6 Using Satellite Imagery. **RSASE** (under review). [arXiv:2411.19093](https://arxiv.org/abs/2411.19093)
- Y. Zhang, **O. Echchabi**, T. Feng, W. Zhang, H.-K. Liao, Z. Lu, C. Chang. SpeedTransformer: Predicting Human Mobility Patterns Using Dense Smartphone GPS Trajectories and Transformer Models. **IJGIS** (under review).

SELECTED PRESENTATIONS

- Monitoring Spartina alterniflora Using Self-Supervised Learning. **Duke Climate+ Symposium**, 2024. [\[poster\]](#)
- Assessing Climate Change Risk of Rural Coastal Plains. **Duke Climate+ Symposium**, 2023. [\[poster\]](#)

PROFESSIONAL EXPERIENCE

Data Analyst Intern

Atos Morocco, Rabat, Morocco

Oct 2022 – Nov 2022

- Built dashboards providing real-time HR metrics to support leadership decision-making; scaled to all African branches.

Data Analyst Intern

XPerlean, Saint-Quentin, France

Jul 2022 – Aug 2022

- Applied Faster R-CNN and YOLO to detect ceramic defects, raising accuracy from 70% → 85%.
- Improved quality control, cut costs, and boosted production speed by 10%.

Data Analyst Intern

Al Jazeera Media Institute, Doha, Qatar

Oct 2021 – Dec 2021

- Scraped and processed 200K+ social media records using APIs to analyze user behavior and engagement.

PERSONAL PROJECTS

Football AI Tracker

Oct 2024 - Dec 2024

Final Project for STATS402: Interdisciplinary Data Science

Suzhou, China

- Built a computer vision system tracking players, referees, and the ball under suboptimal video conditions.
- Provided a low-cost alternative to high-end tracking systems, democratizing football analytics. [\[manuscript\]](#)

ACTIVITIES AND VOLUNTEER WORK

Duke Kunshan University

- Resident Assistant (2024–2025)
- Student Athlete — Soccer Team Co-Captain (2023–2025)
- CS Club — Software Team Lead [\[website\]](#) (2023–2025)
- Math & CS Teaching Assistant (2022–2024)

FADI Academy, Morocco — Partner & Math Tutor (2023–Present)

FIFA World Cup, Qatar — Team Leader, Spectator Services Volunteer (2022)

TECHNICAL SKILLS

Programming/Tools: Python, Java, JavaScript, Bash, Git, Rasterio, GDAL, Google Earth Engine, QGIS, ArcGIS

ML/AI: PyTorch, Scikit-learn, Transformers, Self-Supervised Learning, Computer Vision, Langchain

Other: HPC workflows, Data Pipelines, NLP (BERT, RAG-LLMs)

TECHNICAL SKILLS

Arabic (native); French (fluent); English (fluent); Chinese (intermediate); Spanish (conversational)