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 — $3,000/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 iNNOVATION iNCUBATOR — $3,000 (2023)

RESEARCH EXPERIENCE

Research Intern — **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 an ML pipeline for field fertilizer recommendations; created a decision tool with an integrated LLM (RAG).

Researcher 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 ViTs (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 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
- 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.
Deployed solution in Morocco branch, later 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,
Other: HPC workflows, Data Pipelines, NLP (BERT, RAG-LLMs)

LANGUAGES

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