OTHMANE ECHCHABI

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EDUCATION

McGill University & Mila — Quebec AI Institute Montréal, Canada
M.Sc. Candidate & Research Assistant, Computer Science Aug 2025 - May 2027

Duke Kunshan University Jiangsu, China
Duke University Durham, North Carolina
Bachelor of Science in Data Science (Dual Degree) Aug 2020 - May 2025

Universidad Carlos III Madrid, Spain
Semester Abroad Jan 2022 – May 2022
Relevant Coursework: Statistical Machine Learning, Computer Vision, Deep Learning, Speech Recognition

GRANTS AND AWARDS

DKU Student Experiential Learning Fellowship, 2024
DKU Signature Work Research Grant, 2023 | Awarded $1,500 for research on wetland degradation.
DKU iNNOVATION iNCUBATOR, 2023 | Awarded $3,000 for developing a dialectal Arabic NLP model.
Dean's List, 2021

PROFESSIONAL EXPERIENCE

***AI Intern*, University Mohammed VI Polytechnic** **Benguerir, Morocco | June 2025 – Dec 2025**
- Engineered a geospatial ML pipeline that fuses yield records to deliver field-level fertilizer recommendations.
- Co-developed an agriculture-domain LLM with Retrieval-Augmented Generation for informed responses.

***Data Analyst Intern*, Atos Morocco** **Rabat, Morocco | Oct 2022 – Nov 2022**
- Created dashboards to provide real-time insights into HR metrics, facilitating leadership decision-making.
- Rolled out the solution in the Morocco branch, later expanding to all company branches in Africa.

***Data Analyst Intern*, XPerlean** **Saint-Quentin, France | Jul 2022 – Aug 2022**
- Collaborated with Morocco's leading ceramics manufacturer, using Faster R-CNN and YOLO models to detect defects in ceramics, increasing defect detection accuracy from 70% to 85%.
- Improved quality control and sped up production by 10% and decreased operational costs.

***Data Analyst Intern*, Al Jazeera Media Institute** **Doha, Qatar | Oct 2021 – Dec 2021**
- Scraped large-scale CSV data files using social media APIs, processing over 200,000 data records, to analyze user behavior and interaction data.

RESEARCH EXPERIENCE

Tracking Progress Towards SDG6 **Jun 2024 – Present**
Supervised by Prof. Ka Leung Lam, Duke Kunshan University Suzhou, China
- Assessed piped water and sewage access in Africa using satellite imagery and vision transformers with 97% accuracy; Developed a global dataset for piped water and sewage access.

Echchabi, O., Lahlou, A., Talty, N., Manto, J., Lam, K. L. "Tracking Progress Towards Sustainable Development Goal 6 Using Satellite Imagery." *Water Research*. **(Under review)**. *arXiv preprint* arXiv:2411.19093.

Carbon Footprint Reduction and Trip Mode and Purpose Prediction **Jun 2024 – Present**
Supervised by Prof. Charles Chang, Duke Kunshan University Suzhou, China

- Developed a transformer model for sequence data to predict individual modalities; achieved 94% accuracy in mode identification on the GeoLife dataset with our pre-trained transformer-based model; achieved 92% accuracy in purpose prediction using Point-of-Interest (POI).
- Designed and implemented CarbonClever, a social media application for individual carbon footprint reduction.

Zhang, Y., **Echchabi, O.**, Feng, T., Zhang, W., Liao, H.-K., Lu, Z., Chang, C. "Individual Modality Prediction Using Sporadic Social Media Geolocations and Pre-trained Transformer Models." *International Journal of Geographical Information Science.* **(Under review)**.

Monitoring Spartina Alterniflora Using Self-Supervised Learning **Jun 2024 – Aug 2024**
Supervised by Prof. Wenhong Li and Prof. Ding Ma, Duke University Durham, NC

- Identified evasive coastal wetland species using satellite imagery and ViTs for wetland monitoring.

"Monitoring *Spartina alterniflora* Using Self-Supervised Learning." Climate+ Symposium, Rhodes Information Initiative at Duke, Durham, NC, 2024. [project page] [poster]

Assessing Climate Change Risk of Rural Coastal Plains **Jun 2023 – Aug 2023**
Supervised by Prof. Emily Bernhardt, Duke University Durham, NC

- Developed a comprehensive geospatial database for saltwater intrusion and sea level rise research within the North American Coastal Plain using ArcGIS. [Interactive map]
- Applied NLP models such as BERT to analyze and map insights from over 1,000 scholarly articles.

"Assessing Climate Change Risk of Rural Coastal Plain Communities." Climate+ Symposium, Rhodes Information Initiative at Duke, Durham, NC, 2023. [project page] [poster]

PROJECTS

Spatiotemporal Patterns of the Yancheng Coastal Wetlands Degradation. **Aug 2023 - Present**
Senior Year Thesis Suzhou, China

- Conducted a 25-year spatiotemporal analysis of Yancheng coastal wetlands degradation using satellite imagery and NDVI, highlighting ecological shifts and advocating for targeted conservation strategies. [poster]

Football AI Tracker **Oct 2024 - Dec 2024**
Final Project for STATS402: Interdisciplinary Data Science Suzhou, China

- Achieved accurate tracking of players, referees, and the ball under suboptimal video conditions, providing a cost-effective alternative to high-end tracking systems, democratizing football analytics. [manuscript]

ACTIVITIES AND VOLUNTEER WORK

Duke Kunshan University
Resident Assistant Aug 2024 – Present
Student Athlete – Co-Captain of the soccer team Aug 2023 – Present
DKU CS Club Software Team Lead [website] Aug 2023 – Present
Math and Computer Science TA Jan 2022 – May 2024

FADI Academy **Aug 2023 – Present**
Partner and Math Tutor Remote/Casablanca, Morocco

FIFA World Cup 2022 Volunteer **Nov 2022 – Dec 2022**
Spectator Services Volunteer – Team Leader Doha, Qatar
Led team of volunteers and assisted spectators in two venues with a capacity of 45,000 seats each.

TECHNICAL SKILLS

Python, Java, R, JavaScript, TypeScript, SQL, TensorFlow, PyTorch, Django, React.