Abir HARRASSE

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Education

Master Degree in Industrial Engineering *EMINES-UM6P*
Engineering degree program *Sept 2022 - present*
Coursework includes: Probabilities, Machine Learning, Optimization, Statistics, Multivariable Calculus, Martingale strategies, Lebesgue Integration, Measure Theory, Linear Programming, Biomedical Engineering, Robotics, Analytics, Principles of Economics

Preparatory classes: Maths- Physics- CS - Robotics *EMINES-UM6P*
Preparatory classes program *Sept 2020 - June 2022*
Coursework includes: Real Analysis, General Topology, General Algebra, Linear Algebra, Electromagnetics, Electronics, Robotics

Papers

Adversarial Multi-Agent Evaluation of Large Language Models through Iterative Debates
Chaithanya Bandi, Abir Harrasse*
Available at: arXiv:2410.04663

Industry Experience

Withmartian *September 2024 - Present*
Research Intern *Bay Area, San Francisco*

- Using mechanistic interpretability methods to probe models during reasoning tasks, investigating whether human-interpretable causal algorithms are implemented. The goal is to develop a general framework for conducting mechanistic interpretability experiments.

Research Experience

LLMs evaluating LLMs *April 2024 - August 2024*
Research Intern, supervised by ***Prof. Dr. Chaithanya Bandi*** *National University of Singapore*

- Developed adversarial agentic architectures for evaluating LLM outputs. This project involved designing multi-agent systems where LLMs act as advocates, judges, and juries to dynamically assess responses. By implementing evaluation frameworks that improve decision-making through iterative adversarial interactions, we achieved up to a 8% improvement over existing evaluation techniques.

RL with generative models *Jan 2023 - Jan 2024*
Research assistant *College of Computing-UM6P*

- I worked under the supervision of **Prof. Dr. Omar Saadi** on model-based reinforcement learning with generative models. My role included testing existing algorithms and exploring ways to enhance their runtime or sampling complexity.

Product Assortment Optimization *June 2023 - July 2023*
Research Intern *Africa Business School - UM6P*

- I researched the assortment optimization's problem theoretical and its impact on retailer profitability under the supervision of **Prof. Agnès GORGE**. We explored the assortment problem under substitution and demand uncertainty and designed a new ML heuristic to solve our problem. The research report is accessible through: published report.

Key Achievements and Projects

BCG Platinion Hackathon *October 2023*
Winner *BCG Casablanca*

- Our mobility solution, which optimizes the matchmaking process between transporters, suppliers, and demanders of goods, secured the top national prize and the second-place in the international round. The hackathon drew participants from 7 major global cities.

Morocco IoT and AI Challenge *September 2023*
Finalist *Marrakech, Morocco*

- As a finalist in the Morocco IoT and AI Challenge, I presented an ongoing project called Med-Flamingo. It merges medical visual language models with Large Language Models (LLMs) to develop a medical **chatbot**. This chatbot converses with patients in **Moroccan Dialect**, answering medical questions and creating reports for healthcare professionals. Currently, we are actively working on enhancing the AI safety aspects of our solution. The project is accessible through: medical chatbot.

"Chariot Autonome" Robot *Jan 2023 - May 2023*
AI lead *EMINES-UM6P*

- Collaborated with my team to develop an autonomous robot capable of following the user in real time. Implemented AI features using human tracking algorithms and depth estimation to enhance navigation and interaction capabilities.

Assets flood protection *Mar 2023 - Apr 2023*
Project leader *EMINES-UM6P*

- We developed exact algorithms to optimize the cost of building walls around a city of assets for small data and meta-heuristic algorithm to tackle the case of large data.

Asthma Mathematical Modelisation *Oct 2022 - Dec 2022*
Project leader *EMINES-UM6P*

- Under the guidance of **Prof. Marcel Filoche**, our biomedical engineering project applied mathematical modeling, employing Navier-Stokes equations to simulate asthma and gain insights into respiratory airflow during attacks. The project is accessible through: results.

NaMO - Preparing for IMO's 61st edition *Jan 2019-March 2020*
Participant *Rabat, Morocco*
Among the top 25 participants selected for the country's most prestigious mathematical competition, where the best high school students gathered to prepare for international contests like the International Mathematical Olympiads (IMO).

Awards

National Moroccan Merit Scholarship FAR	For the first 50 national scores of high school final examinations.
UM6P Excellence Scholarship	For outstanding results in entrance examinations.

Skills

Languages	*Native:* Arabic, French. *Fluent:* English. *Beginner:* Mandarin
Programming Languages/Tools	Python, Pytorch, Transformers, Diffusers, Datasets, Slurm, FICO Xpress, SQL

Volunteering

The GenAI Winter School *Oct 2023-Present*

Organizer

Taking an active role in the coordination and organization of The **GenAI Winter School**, an upcoming event set to welcome distinguished researchers including **Yann Le Cun**, **Eric Xing**, and other prominent figures in the field.

MathMaroc *Sept 2021-Present*

Vice General Secretary

Collaborating with fellow members to organize events, workshops, and outreach programs to engage students and enthusiasts in the exploration and appreciation of mathematics.

President and Founder of E-maths *Jan 2021 - June 2021*

EMINES-UM6P

Founded the first mathematics club at EMINES-UM6P to promote math culture through ludic activities, conferences and peer-to-peer workshops and study groups. Organized orientation sessions connecting students with alumni to explore academic and research pathways.

General Secretary and co-founder of Rotaract EMINES *Jan 2022 - June 2022*

EMINES-UM6P

A club with a social impact that aims to make students have a positive impact on local communities in need.