MOHAMMED EL BARAKA

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EDUCATION

EMINES - School of Industrial Management, Mohammed VI Polytechnic University (UM6P)
Benguerir, Morocco
Engineering Cycle, Industrial Management *Sep. 2023 – Present (Expected Graduation: 2026)*

- Specialization in Industrial Management.
- Relevant Coursework: Optimization, Data Science, Machine Learning, Project Management.

CPGE Moulay Abdellah Safi, Morocco
MPSI - MP preparatory classes (maths, physics, and engineering) *Sep. 2021 – June 2023*

- Intensive program in Mathematics, Physics, and Engineering Sciences.
- **Excellent Academic Standing**

SKILLS SUMMARY

- **Technical Skills:** Programming (Python, C, Java, JavaScript, Bash, SageMath), Data Analysis, Optimization Algorithms, Machine Learning, Power BI, SQL, Project Management Softwares.
- **Soft Skills:** Leadership, Teamwork, Communication, Problem-Solving, Time Management, Organizational Skills.
- **Languages:** Arabic (Native), French (Fluent), English (Fluent), Mandarin Chinese (Beginner).

PROJECTS

Reducing Noise Pollution Caused by Road Traffic

Presented in June 2023

- Investigated methods for reducing road traffic noise pollution using porous materials for noise barriers.
- Modeled traffic noise and analyzed the behavior of sound waves in porous mediums.
- Conducted experimental tests using Kundt's tube to evaluate the sound absorption coefficient of different porous materials (compact and alveolar mousse).
- Technologies: Acoustics, Noise Modeling, Material Science, Experimental Design, Kundt's Tube Method, Data Analysis.

Biomedical Engineering Project: Oxygen Diffusion in Acinus

Presented in Dec 2023

- Conducted a biomedical engineering project focused on modeling oxygen diffusion within the pulmonary acinus.
- Resolved the diffusion equation in 2D with various boundary conditions, including constant and time-dependent Dirichlet conditions, using numerical methods.
- Studied the impact of domain deformation on oxygen transport, visualizing concentration heatmaps under different parameters.
- Technologies: Mathematical Modeling, Diffusion Equation, Numerical Methods, Python (with libraries like NumPy, SciPy, Matplotlib), Biomedical Engineering Principles.

Optimization Project for Red Fruit Production in Greenhouses

Presented in may 2024

- Designed and implemented an optimization model using Linear Programming to maximize profit for red fruit production in greenhouses.
- Developed Python code using Pulp library to solve the large-scale optimization problem considering various scenarios, constraints (sector limitations, surface area), and weeks of the year.
- Evaluated different production strategies and presented results for optimal scenario selection under market demand constraints.

- Technologies: Linear Programming, Pulp (Python Library), Optimization Modeling, Algorithm Design.

Building a Connected View: Bank Statement Integration with Power BI

Presented in June 2024

- Developed an interactive Power BI dashboard integrating bank statements with purchase/sales delivery notes.
- Established relationships between Excel sheets (Bank Statement, Purchase/Sales Delivery Notes, Cost Function) in Power BI for a connected data view.
- Visualized key financial metrics including total amounts by cost function, expenses by supplier, and revenue by client.
- Technologies: Power BI, Excel, Data Analysis, Dashboard Design.

Cryptography Project: Attacks Against Shared Module RSA

Presented in Dec 2024

- Conducted a study on attacks against shared module RSA cryptosystem, focusing on theoretical and mathematical principles behind vulnerabilities.
- Simulated and analyzed various attacks, including scenarios where decryption keys are compromised due to shared modules.
- Implemented attack simulations in Sagemath to demonstrate the feasibility and impact of these cryptographic vulnerabilities.
- Technologies: Cryptography, RSA Algorithm, Cryptanalysis, Number Theory, Sagemath, Security Analysis.

Analytics Edge Project: Predictive Analytics for Student Mental Health

Presented in Jan 2025

- Developed predictive models for student mental health assessment using questionnaire and text-based data.
- Implemented a VotingClassifier ensemble model combining Logistic Regression, Decision Trees, and other classifiers in Python.
- Achieved high accuracy in predicting anxiety (87.22%), depression (85.1%), and stress (75.21%) levels based on questionnaire data.
- Built two user interfaces (questionnaire-based and text-based) to deploy the predictive models for practical use.
- Technologies: Machine Learning, Predictive Modeling, Classification, NLP, Python (Scikit-learn, NLTK), Data Analysis, Web Interface Development.

LEADERSHIP AND ACTIVITIES

Leadership Roles

UM6P Rubik's Cube Club President *2024 - Present* | **E++ Club, EMINES** Sponsoring Manager *2024 - Present* | **E-Astronomy Club, EMINES** Logistics Manager *2024 - Present* | **ROTARACT EMINES Club** Communication & Content Creation Manager *2024 - Present* | **UM6P Ping Pong Club** Logistics Manager *2024 - Present*

Sports

UM6P, EMINES Handball Teams Player *2024 - Present* | **UM6P Volleyball Team** Player *2024* | **EMINES Football Team** Player *2023*