Younes SADDOUG

95360 Montmagny 21 years old

Final-year Engineering Student

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EDUCATION

2022-2025 — **Engineer in Applied Mathematics & Scientific Computing**
Sup Galilée Engineering School, Sorbonne Paris Nord University – Paris, France

2023 — **Bachelor's Degree in Mathematical Modeling and Engineering**
Institut Galilée, Sorbonne Paris Nord University – Paris, France

2020-2022 — **Preparatory Classes for Engineering Schools (CPGE) - Physics and Engineering Sciences**
Ibn Ghazi – Rabat, Morocco

2020 — **International Baccalaureate High School Equivalence : Physics Option**

PROFESSIONAL EXPERIENCES

Summer 2023
(2 months)

Al Barid Bank: Internship in the Business Intelligence Department – Predictive Analysis of Time Deposit Subscriptions

- Conducted a thorough analysis to understand the business problem, including customer segmentation, marketing campaign effectiveness, and key factors influencing subscription decisions.
- Levereged SQL for data manipulation.
- Implemented preprocessing using **sklearn.preprocessing** to address class imbalance, feature scaling, and optimal feature selection.
- Developed and fine-tuned diverse machine learning models, including K-Nearest Neighbors, regularized logistic regression variants, and ensemble methods such as XGBoost.
- Conducted model performance analysis using ROC-AUC curves, cross-validation techniques, and statistical significance testing to validate improvements.

PROJECTS

- **N-Body Problems - Astrophysics and Celestial Mechanics Simulation**
  - Derived analytical solutions for specific configurations of the N-Body Problem.
  - Implemented numerical simulations using adaptive step-size 4th order Runge-Kutta methods on MATLAB.
  - Conducted validation of simulations through comparison with analytical solutions and established benchmarks.
  - Performed comprehensive error analysis to assess numerical stability and long-term evolution of simulated systems**.**
  - Optimized computational efficiency through parallelization techniques and algorithm refinement.
  - Investigated and visualized planetary phenomena, including gravitational resonances, chaotic orbits.

- **Participation in the 25th edition (2023/2024) of the Sup Galilée Enterprises Forum to present my major, Applied Mathematics.**

- **Solving the 1D Viscous Burgers' Equation through Deep Learning techniques**
  - Investigated the application of state-of-the-art supervised\unsupervised deep learning paradigms to physical systems.
  - Implemented and compared mesh-based and mesh-free deep learning architectures for solving nonlinear PDEs (e.g.,PINNs).
  - Engineered custom neural network architectures across diverse boundary & initial conditions.
  - Developed a data generation pipeline using numerical schemes to create training datasets for supervised learning models.
  - Evaluating the performance of the models and exploring improvements through fine-tuning.
  - Comparing the performance of DL with traditional numerical solutions of the equation (FDM,FEM,FVM).

SKILLS & TOOLS

Software

C / Python / R / Git / SQL / NoSQL / Matlab / Cuda
Power BI / Azure / AWS (ML & analytics services)

Technical skills

- ***Numerical analysis***
  Expertise in solving linear and non-linear systems with various methods. Proficient in stability, convergence, error analysis, and performance benchmarking, including parallel computing with CUDA.

- ***Partial differential equations***
  In-depth theoretical knowledge and practical application of numerical methods such as Finite Difference Method (FDM), Finite Element Method (FEM), and Finite Volume Method (FVM).

- ***Stochastic processes and probability theory***
  Advanced understanding of stochastic modeling and probability theory.

- ***Optimization***
  Proficient in diverse optimization algorithms, especially methods applicable to machine learning.

- ***Statistics***
  Skilled in statistical computing, multivariate analysis, inferential statistics, and statistical learning theory.

- ***Data analysis***
  Extensive experience in data manipulation, transformation, and advanced statistical analysis using Pandas ,Numpy and other data analysis libraries. (e.g.,Seaborn, Matplotlib, etc…).

- ***Machine learning \ Deep Learning \ AI***
  Extensive experience in designing and implementing machine learning algorithms (Scikit-learn), with strong proficiency in neural networks using PyTorch. Intermediate level in NLP and computer vision, with familiarity in leveraging tools like Hugging Face for model development and deployment.

Languages

English : *Advanced*, ***French*** *: Bilingual*, ***Arabic*** *: Bilingual*

HOBBIES & INTERESTS

High-Tech, Artificial Intelligence, Chess.