Mihnea-Andrei Velcea

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SKILLS

- Python
- Java
- C/C++
- SQL
- Git/Github
- Docker
- Model selection
- Model evaluation
- Machine learning
- SQL
- Scikit-learn
- Big data analytics
- Natural language processing
- CI/CD
- API Development&Integration
- MLOps
- DevOps

PROJECTS

Deepfake Image Classification
Multi-Class ML image classifier
03/2025 – 05/2025
Competed in an image classification challenge focused on detecting deepfake images generated by advanced generative models. Designed and trained custom (non–pre-trained) models from scratch, achieving 91% classification accuracy on the test set. Improved performance through ensemble learning, grid-search hyperparameter tuning, and data augmentation, ensuring robustness against overfitting and distribution shifts.

- Technologies: **PyTorch, Pandas, NumPy, Pillow**

Stochastic Process Simulation & Statistical Modeling
12/2024 – 01/2025
Developed an R-based simulation framework to model sequential stage completion times with exponential random variables and probabilistic stopping conditions. Approximated expectations, probabilities, and distributions of total process times through large-scale Monte Carlo simulations (10^6 runs), and validated against exact analytical results. Built interactive Shiny applications to visualize probability distributions (Normal, Exponential, Poisson, Binomial) and compute distribution-specific moments. Implemented parameter estimation using Maximum Likelihood Estimation (MLE), Method of Moments, and numerical optimization for multiple probability distributions.

- Technologies: **R, Shiny, Monte Carlo Simulation, MLE, Statistical Inference, Probability Modeling, Data Visualization**

Autonomous Agentic AI for Quantum Error Correction
11/2025 – 11/2025
Engineered an autonomous Agentic AI pipeline designed to diagnose and correct physical quantum hardware errors, effectively reducing calibration time from hours to seconds. Trained a custom supervised learning model on synthetically generated circuit data, achieving 85% diagnostic accuracy across five distinct error categories including stochastic noise and crosstalk. Developed a Retrieval-Augmented Generation (RAG) system using a local Gemma-3 LLM to dynamically generate hardware-aware circuit patches based on classified faults. Implemented a closed-loop control architecture with a secondary "Critic" agent to logically validate repairs, establishing a robust pre-flight calibration protocol for quantum processors.

• Technologies**: LangChain, Gemma-3 (Local LLM), RAG, PyTorch, Synthetic Data Generation, Agentic AI, Closed-Loop Control**

EDUCATION

BSc in Computer Science
Universitatea din București
10/2023 – Present | București

- Relevant Coursework: Computer Vision, Reinforcement Learning, Probabilities and Statistics, NLP, Data Structures, Artificial Intelligence, Software Engineering.

High School Diploma
Colegiul Național "Spiru Haret" București
09/2019 – 07/2023

ORGANISATIONS

Mathematics and Computer Science Student Association
Volunteer
11/2023 – Present | București

- **Project Management:** Successfully planned and executed two major organizational projects from conception to completion, overseeing all logistics, budgeting, and team coordination to achieve strategic goals.
- **Fundraising & Operations:** As a member of the Management and Fundraising department, contributed to developing strategy and organizing campaigns that secured vital funding for the organization's operations.
- **Team Coordination:** Supported human resources functions by assisting in volunteer onboarding, scheduling, and fostering a collaborative team environment to maximize engagement and productivity.
- **Cross-Functional Leadership:** Balanced hands-on fundraising tasks with broader management responsibilities, demonstrating strong adaptability, problem-solving, and commitment to the organization's mission.