Tooba Rahimnia

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SKILLS

- **Programming Language** (Python, Java, C++, SQL, HTML/CSS)
- **Framework & Technology** (Git, Pandas, TF-Keras, Pytorch, NLTK, PySpark, spaCy, LightGBM, CatBoost, XGBoost, AWS, SKlearn, Scipy, OpenCV, Seaborn, Anaconda, Flask, Django, LangChain)

EXPERIENCE

MILA - QUÉBEC AI INSTITUTE **Montréal, QC**

Machine Learning Researcher **Feb 2022 - Nov 2024**

Eulerian-Based Fluid Simulation (Thesis)

- Researched and optimized supervised and unsupervised ML algorithms, developing a high-accuracy fluid-simulation model with neural network for animation using PyTorch, NumPy, and Scikit-learn, increasing computational efficiency by 50%.
- Authored a scholarly article on fluid dynamics in computer graphics and delivered an expert seminar at McGill's Graphics Lab on grid-based inviscid liquid simulation techniques.

SELF-EMPLOYED (Technical Writer) **May 2024 - Present**

- Launched **CognitiveDiscoveries**, a personal blog with detailed posts on machine learning, web apps, and Kaggle roadmaps, growing an active audience of 1000+ readers.

TELUS TELECOMMUNICATION INC. **Montréal, QC**

Data Engineer **Jan - Aug 2021**

- Led collaboration with the Big Data & Automated Intelligence team, enhancing innovation, efficiency, and team communication for streamlined data management processes.
- Conceptualized and implemented a backend pipeline on Google Cloud Platform, optimizing big data transfer from Amazon S3 and deploying BigQuery, SQL, and Airflow, which boosted workflow efficiency by 20%.

PROJECTS

Retrieval Augmented Generation (RAG) Bot

- Built a RAG-based bot using Python, LangChain, and FAISS vector database to efficiently embed and store text from 1000+ documents using SentenceTransformers, enabling effective similarity searches.
- Developed a query embedding system that retrieves relevant data and constructs contextualized prompts for large language models (LLMs) to generate accurate responses based on user queries.

Skin Cancer Detection

- Developed advanced image-based algorithms in partnership with ISIC to accurately detect histologically confirmed skin cancer cases from single-lesion crops in 3D Total Body Photos (TBP), significantly improving early diagnosis potential.
- Designed and implemented an automated data pipeline using an ensemble of LGBM, XGBoost, and CatBoost models, enhancing prediction accuracy by 20%. Optimized performance with Optuna for hyperparameter tuning, stratified GroupKFold cross-validation, and feature importance analysis.

Recommendation System Design

- Developed a book recommendation web app for a small Montreal-based retail store using Flask, leveraging a content filtering approach and clustering algorithms (K-Means, Gaussian Mixture Model) for training, which improved recommendation accuracy by 92% and reduced wall time from 11 minutes to 7 microseconds.
- Handled a 107 MB Kaggle dataset, performing data preprocessing, model training, and deployment, resulting in a scalable solution that could manage up to 1000 user queries simultaneously.

YOLOv10 Model Deployment

- Engineered an object detection web app for video and image inputs and a curated dataset of 2,000 entries, implementing real-time detection via a scalable RESTful API built with Django in a Mamba environment.
- Deployed the app on an Amazon EC2 instance running Ubuntu, optimizing performance and reliability, achieving exceptional accuracy and operational efficiency.

EDUCATION

MCGILL UNIVERSITY **Montréal, QC**

Master of Science in Intelligent Systems - Thesis Based **2021-2024**

- Awards: Graduate Excellence Fellowship ($6000), Mila's Women in AI Excellence Scholarship ($10,000)

Bachelor of Engineering, Major in Electrical Engineering **2016-2020**

- Award: Robert & Marjorie Simpson (Entrance) Scholarship