MOHAMED ELBELTAGI

Data Scientist - Ottawa, ON, Canada

Portfolio: m-elbeltagi.github.io

EDUCATION

Carleton University	Ottawa, ON
PhD Particle Physics	Sep 2018 - Apr 2024

Carleton University	Ottawa, ON
BSc Honours Theoretical Physics (Minor: Mathematics)	Sep 2014 - Apr 2018

TECHNICAL SKILLS

Languages::	Python, SQL, JavaScript, C++
Tools/Libraries::	Pandas, Scikit-Learn, MATLAB, Matplotlib, AirFlow, AWS, PyTorch, Flask, Git, Docker

WORK EXPERIENCE

Carleton Univeristy - Physics Department	Ottawa, ON
Research Assistant/Data Analyst	May 2018 - Present

- Led the collection, storage, and analysis of laboratory sensor data using **Python** and LabVIEW, creating graphs (using **Seaborn** & **Plotly**) and weekly reports about the system status, leading to 50% faster project completion.

- Developed a **Python** library for signal processing and **time series analysis** (with visualizations and reports), enabling pattern recognition and predictive analysis, identifying over 90% of events of interest.

- Applied an innovative **Monte Carlo** method to a machine learning classifier (**boosted decision tree**) to improve probability density estimation for detector events, which sharpened the precision of measurement uncertainty.

Advanced Symbolics	Ottawa, ON
NLP Engineer Intern	Summer 2023

- Actively engaged in **MLOps**, orchestrating the operation of **NLP** production pipeline on **AirFlow** (utilising **Git**), and updating tasks to speed up the output by up to 5 times faster.

- Researched latest papers to engineer and integrate custom metrics to evaluate **NLP** tasks (including clustering and summarization), leading to 2× the intra-cluster relevance scores.

APPLIED PROJECTS

Twitter Troll Detection   https://m-elbeltagi.github.io/
-Developed an NLP solution utilizing fine-tuned BERT and a few-shot leaning technique (without prompts) to detect and mitigate the influence of Twitter bots on political discourse and misinformation spread, achieving over 90% accuracy.

Convolutional Generative Network
- Designed and implemented in PyTorch a deep convolutional generative adversarial neural network (DCGAN), trained to generate images of natural landscapes with 3 color channels.

ChatDR
- Fine-tuned a medical chatbot (extractive QA) to answer questions about a patient, given their medical history, as a proof of concept for the applications of this technology in optimizing doctor/patient time.

ACHEIVEMENTS

- Won 3rd place for the "Twitter Troll Detection" project at Data Day 9.0 competition (https://science.carleton.ca/dataday9/)

- Implemented and presented a research plan (to a judging committee) as part of the successfully awarded academic grant proposal (nEXO NSERC 2022 grant valued at 930,000$).

- Fast-tracked into PhD program (skipping Master's) after displaying high academic performance, and strong research potential.

PUBLICATIONS

- **Google Scholar Profile: Mohamed Elbeltagi**
https://scholar.google.com/citations?user=Wv_oG8QAAAAJ&hl=en\