

Mohamed Ghaith Majjani

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TECHNICAL SKILLS

HF Transformers MNE NiBabel Nilearn TensorFlow SimpleITK SciPy Scikit-Learn PyTorch Nengo Keras
SQL MATLAB JavaScript Java Python Git C++ C#

WORK EXPERIENCE

MACHINE LEARNING RESEARCHER | SUNNYBROOK | AUG 2022 – JAN 2023

- Combined **Self-Supervised Representation Learning** with dictionary-based functional modes
- Reduced upstream training loss of GPT-2 model on a **Casual Sequence Modeling** paradigm by 44%

MACHINE LEARNING RESEARCHER | SUNNYBROOK | JAN 2022 – APR 2022

- Predicted prognosis of spines suffering from cancer by employing a **GAN** trained on spine CT scans
- Proposed AlphaDamage, a computationally driven hybrid ML-Physics model to **subvert data limitations**
- Researched AlphaDamage Zero for complete **scaling on computation** and few-shot learning of clinical data
- Devised **multimodal CNN** to leverage “MicroDamage” dataset towards incorporating smaller scale mechanics
- **Generalized** Sarcopenia segmentation model through variational cropping window and overfitting management

SOFTWARE ENGINEER | FUNDEVOLVE | JUN 2021 – SEP 2021

- Grew startup frontend, backend, **API** from zero to beta access with limited initial full stack knowledge
- Revised product to follow best practices and **patch six bugs**/vulnerabilities through code review
- Onboarded five new interns through company code patterns and **Agile** methodology

PROJECTS AND CLUBS

DEEP LEARNING | “SELF SUPERVISED FEATURE LEARNING” | NOV 2022

- Extracts contextualized high level feature abstractions from **unlabeled** data
- Training **Deep Q-Network** agent to mask features for an autoencoder

DEEP LEARNING | OPTIMIZED “OPTICAL” MODEL | MAY 2021

- Increased accuracy from **70% to 90%** on Motor Imagery classification by reworking the architecture
- Employed **Bayesian Optimization** on DL Network, boosting accuracy to 95% and precision from 83% to 100%

NEUROENGINEERING | CORTECH – UW NEUROTECHX CHAPTER | AUG 2020 – JAN 2022

- Implemented XGBoost, and Neural Networks in Keras pipeline for **EEG**, motor classification problems
- Wrote CNNs, SVMs in MATLAB for image classification and anomaly detection from **first principles** approach
- Coded temporal and spatial filters such as **Morlet Wavelets** and PCA from scratch for feature extraction

LITERATURE REVIEW | MACHINE LEARNING ATELIER | NOV 2020 – APR 2021

- Researched and wrote paper reviewing the future of brain image reconstruction algorithms from current and anticipated hardware advances such as Neuralink and the WIMAGINE ECoG BCI - DOI: 10.5281/zenodo.4435168
- Interpreted hardware and software bottlenecks to predict the future of brain decoding algorithms

HACKATHON (SEMIFINALIST) | JOHN HOPKIN'S MEDHACKS | SEP 2020

- Designed bracelet that alerts health professionals in real time when pain is detected in patient EEG
- Recreated preprocessing steps from study on pain and fit extracted features to logistic regression model

EDUCATION

Candidate for B.A.Sc. in Biomedical Engineering (2020-2025) - University of Waterloo

- Pursuing AI option and Neural Engineering Specialization