Elia Pattacini

eliapattacini0@gmail.com | +393343507488 | https://www.linkedin.com/in/elia-pattacini-732a9822a/

Skills

Programming: Python, MATLAB, RStudio, C++, SQL
Artificial intelligence Frameworks: Keras, Tensorflow, OpenCV, Pandas, Scikit-learn, Numpy
AI Architectures: Transformers, Convolutional Neural Networks (CNN), Neural Networks, LightGBM, Random Forest
Others: Microsoft Office Package, Git
Languages: Italian (Native), English (C1 - IELTS certification)

Experience

Internship for Master thesis, Kaunas University of Technology(KTU)- Kaunas, Lithuania April 2023 – June 2023

- Development of a Deep Learning algorithm for the classification of ECG beat types between three categories (N,S,V) using a transformer architecture with a convolutional attention mechanism.
- Implemented various data preprocessing steps, including lead selection, filtering, resampling, normalization, beat segmentation and data augmentation.
- Developed a cascade model using binary classifiers and compared it with a multiclass model, demonstrating its superior performance.
- Tested on different datasets, reaching a f1 score of 0.93 and a precision of 0.95.
- Worked with an international team for the implementation of artificially generated data in the training dataset.

Projects

CNN for plant leaf classification

- Use of CNN for classifying plants, based on an image of their leaf.
- Use of both custom CNN architecture and transfer learning for reaching an accuracy of 0.98 in a separated test set.
- Led a group of four international students

Predicting Road Flooding with Machine Learning

- Implemented data preparation by merging multiple datasets, creating unique road identifiers, and calculating parameters such as flooded connecting roads.
- Applied oversampling techniques, feature engineering, and scaling to balance and preprocess the data.
- Trained and evaluated a LightGBM classifier with grid search for hyperparameter tuning, achieving high performance in predicting road flooding.

Development of AI Chat Bot Using Wizard of Wikipedia Dataset

- Fine-tuned a GPT-2 model for generating conversational responses using the "Wizard of Wikipedia" dataset.
- Implemented data preprocessing, tokenization, topic modeling (LDA), and clustering (KMeans) techniques.
- Collaborated with a team.

Analysis of physiological signals for emotional recognition

- Study of three different physiological signals (ECG, RESP, SC) for emotional recognition on a health patient.
- Preprocessing of all different signal and extraction of relevant features (HRV)
- Use of PCA for the division of the features on the different emotional states.

Education

Politecnico of Milan, Italy – MSc in Biomedical Engineering April 2024
University of Patras, Greece – Erasmus semester in Biomedical Engineering February 2023
Politecnico of Milan, Italy – BSc in Biomedical Engineering March 2021
Notre Dame-Bishop Gibbons, Schenectady NY USA - High School Exchange Program June 2016