I am the right candidate

Delwende Eliane Birba

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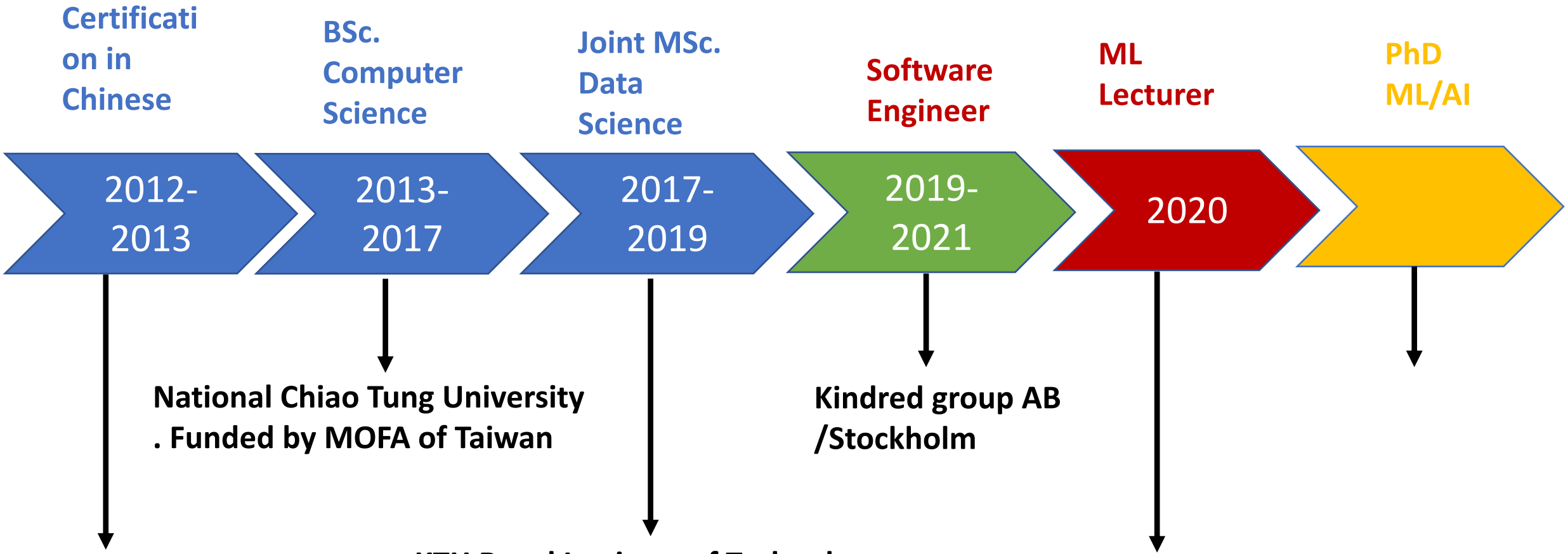
Content

Background

Experience: software engineering/ Machine Learning

First Girl in both Mathematics and Physics , National Olympiad , Burkina Faso 2011


Certificati on in Chinese
BSc. Computer Science
Joint MSc. Data Science
Software Engineer
ML Lecturer
PhD ML/AI
2012-2013
2013-2017
2017-2019
2019-2021
2020
Fu Jen Catholic University
National Chiao Tung University . Funded by MOFA of Taiwan
KTH Royal Institute of Technology And University Sophia Antipolis of Nice . Funded by EIT digital master school
Kindred group AB /Stockholm
Virtual University of Burkina Faso

An explainable XGBoost–based approach towards Preeclampsia risk prediction

Delwende E Birba

Abstract

Preeclampsia (PE) is a heterogeneous and complex disease associated with rising morbidity and mortality in pregnant women. Early recognition of patients at risk is a pressing clinical need to significantly reduce the risk of adverse pregnancy outcomes. This study aimed to develop and evaluate an explainable machine learning for preeclampsia prediction. Extreme gradient boosting method were used to construct the prediction models and achieved AUC score of 0.90.

Introduction

Preeclampsia (PE) is a pregnancy-specific syndrome that affects 3-5% of pregnant women and is characterized by hypertension, and proteinuria [1]. Many studied have applied ML techniques that include metabolites, images analyses, and risk factors datasets, among others to diagnose and to predict PE. However, they do not present any elements to support Explanations ability for medical experts. **Aim:** To develop models using machine learning to predict late-onset preeclampsia based on plasma protein.

Methodology

eXtreme Gradient Boosting (XGBoost) were used with 5 folds cross validation to train the data. eXtreme XGBoost constitutes an efficient and scalable variant of the Gradient Boosting Machine (GBM) algorithm, leveraging the power of decision tree ensembles towards performance optimization.
Interpretability: SHAP values for XGBoost interpretability

Results

DATA

- Public dataset used in [3]
- 90 patients with normal pregnancies (controls) and
- 76 patients with late-onset preeclampsia defined as preeclampsia diagnosed at ≥34 weeks of gestation)
- **1125 proteins**

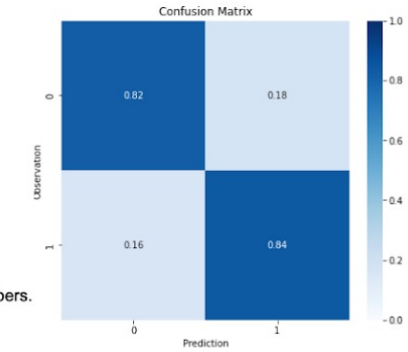
Total features: 1230

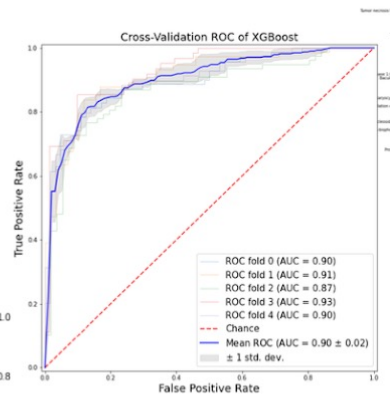
Sample size: 666 samples

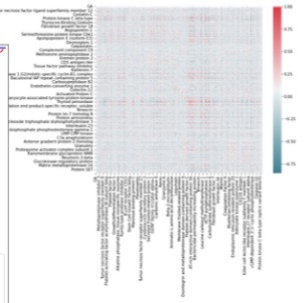
Table: Patient and pregnancy data.

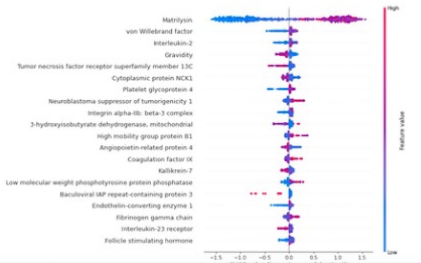
Characteristics	Preeclampsia (n=76)	Controls (n= 90)
Age (Years)	22.0 [21.0–29.0]	24.0 [21.0–27.8]
Body max index (kg/m2)	30.0 [24.8.0–36.2]	26.5 [22.8–33.2]
Race		
African American	72	84
Caucasian	4	6
Pregnancy		
Parity((nulliparity)	32	26
Gravidity	2[1-4]	3[2-5]
Gestational age at delivery	38.7 [37.7–39.4]	39.4 [39.0–40.4]

Reported are the median and interquartile range or absolute numbers.









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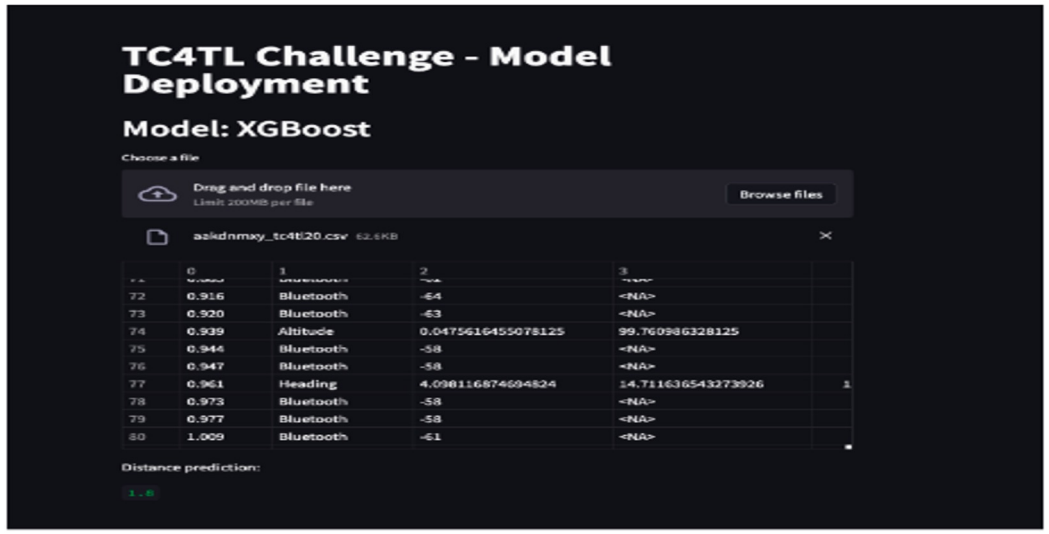
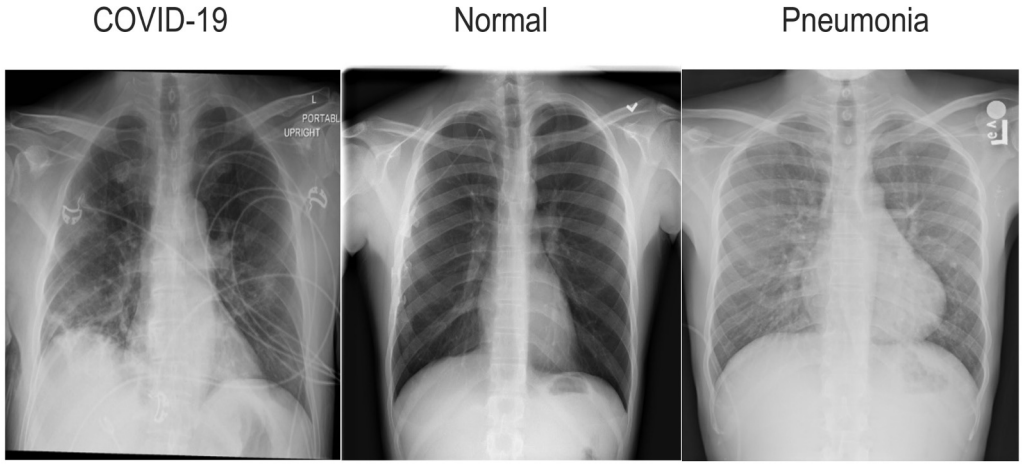


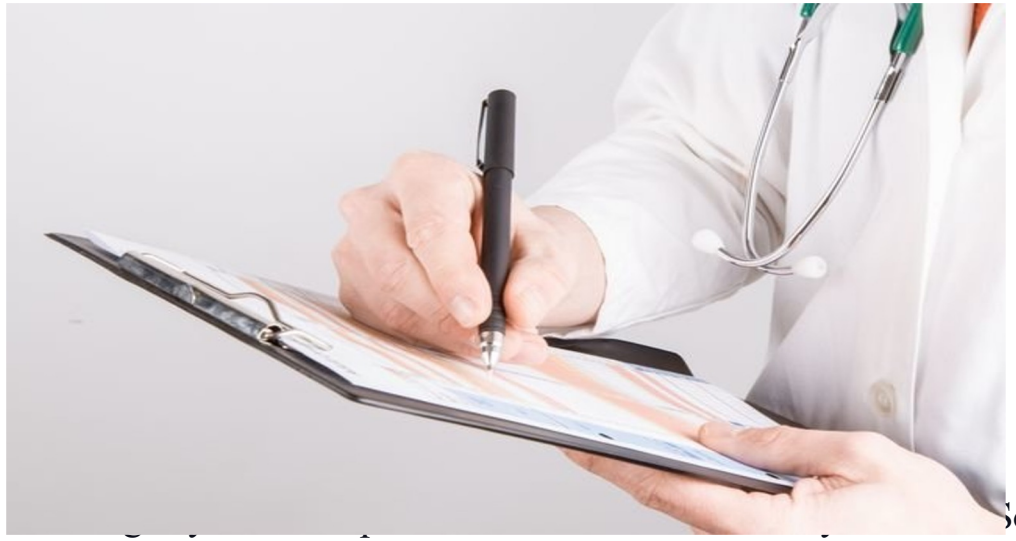
I worked on COVID 19 social distance prediction problem. I used the National Institute of Standards and Technology (NIST) **Too Close for Too Long** data set to propose a convolutional neural network to classify the distance based on the Bluetooth signal, accelerometer, and gyroscope value from the users smartphones.

Source code

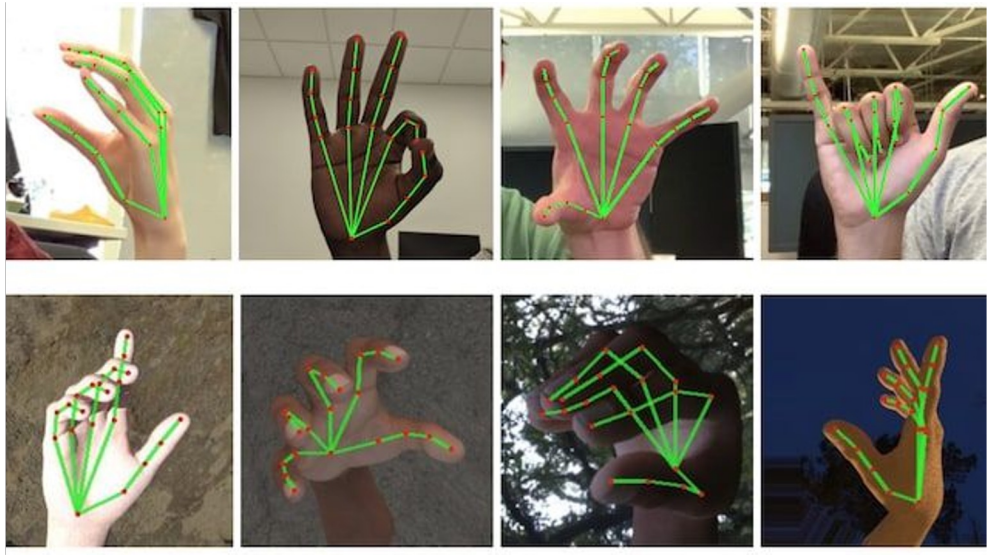


I took part in the challenge of COVID-19 in the Chest X-ray images multi-classification task. proposed for Ethics and Explainability for Responsible Data Science (EE-RDS) conference. My proposed solution building on ResNets was ranked **17th on 33**.

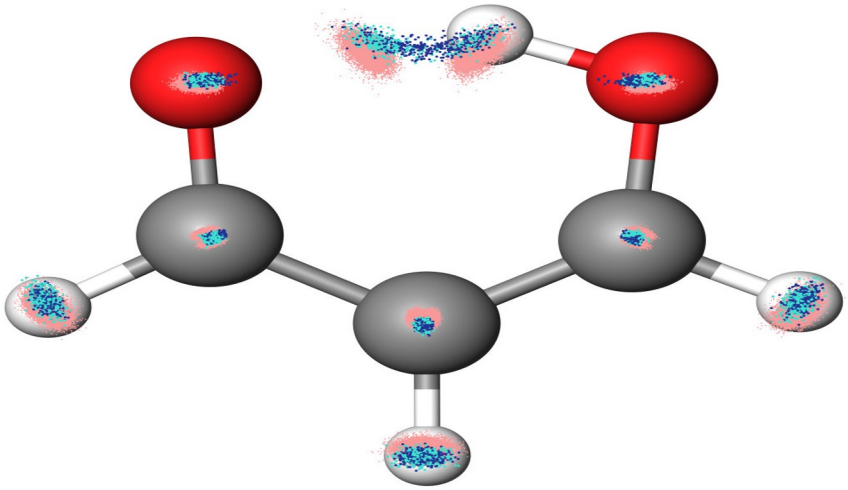
Source code



Sophia Antipolis, I implemented a deep learning model for English and French clinical notes correction. I proposed a character level sequence to sequence learning with LSTM RNNs to detect and correct misspellings in clinical notes with 97% accuracy.
Github



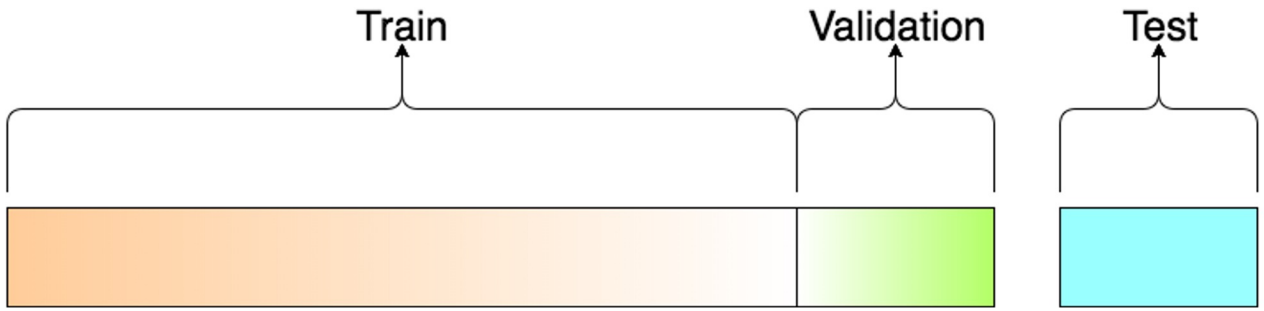
Convolutional Neural Network model face tracking and hand sign language interpretation in real time camera. Implemented with OpenCV, C++
Github



Machine learning model for odor molecules psychophysiology effects prediction.

I proposed a machine learning model to classify the odor molecules as an enhancing activity (or positive effect "+") or a decreasing activity (negative effect "-") for heartbeat rate variation and temperature. Such an approach will be important because it should allow us to design and optimize odorants or perfumes to affect our emotional state positively. My abstract has been accepted for two workshops at NeurIPS 2019 (WiML and Learning Meaningful Representations of Life). Presenting my work at two workshop poster sessions with a travel grant reaffirmed my passion for machine learning.

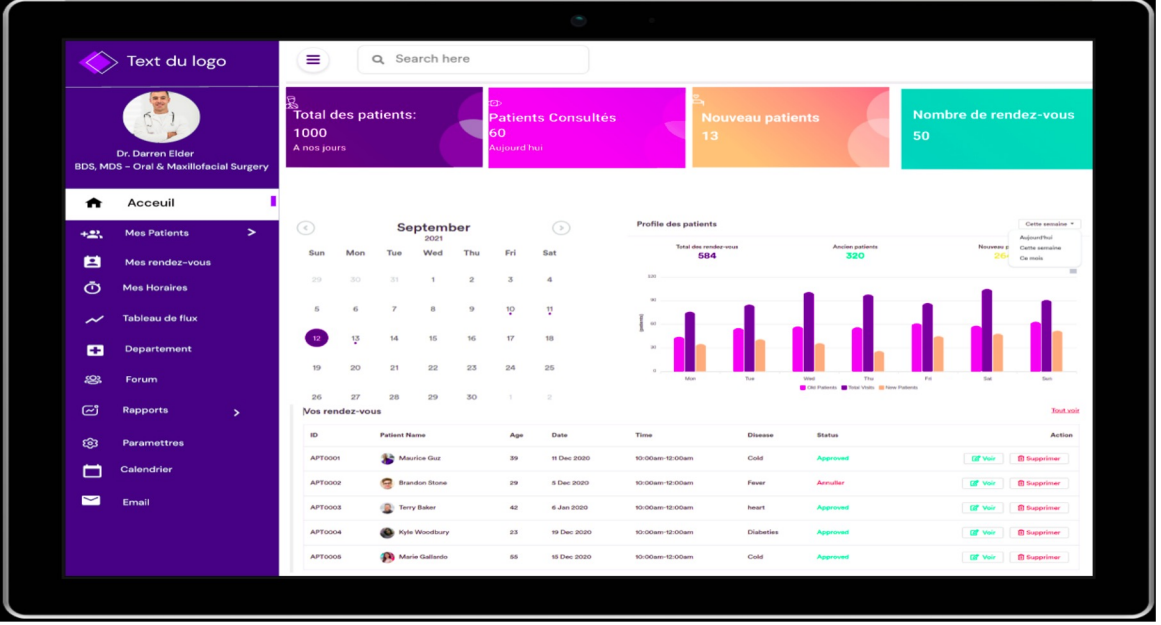
Report



Report

Comparative study of data splitting algorithms for machine learning model selection.

Model validation is one of the important parts of building a supervised machine learning or deep learning model. For creating a model with better generalization performance, one must have a sensible data splitting strategy because this is important for model validation. So I conducted a comparative study on various reported data splitting algorithms such as k-fold, Kennard-Stone, SPXY (sample set partitioning based on joint x-y distance), and random sampling algorithm on simulated and real data



In collaboration with Dr. Theophile Sawadogo, a neuroscientist based in France, I developed MedicSoft. MedicSoft serves as a medical health record for doctors and patients. It's also a hospital management platform for appointment booking, medical prescription, task planning, and teleconsultation. The project is currently in the pilot phase with two clinics in Burkina Faso.
Java, Spring Boot

kindred

UNIBET

32Red

- I worked as Software engineer at Kindred group from 09/2019-11/2021.
- I have led and contributed to the implementation and deployment of Trustly , Adyen, Earthport, Swish payment apis into Kindred different platforms such as Unibet, Casino, 32Red

- International working experience
- I speak French, English and Mandarin
- I can easily update and collaborate with people around the world.
- Born in Burkina Faso
- 5 years in Taiwan, Asia
- 5 years in Europe

Thank you