MI2 SUMMER CONF

August 2, 2021

Warsaw, MiNI PW 107

Agenda

11:30 - 11:45 Welcome session

11:45 - 12:10 Elevator pitch I

12:10 - 13:00 Poster session I

13:00 - 13:30 Lunch

13:30 - 13:45 Regular talk

13:45 - 14:10 Elevator pitch II

14:10 - 15:00 Poster session II

15:00 - 15:15 Best Poster Contest

15:15 - 15:30 Close-up session

Regular talk

Monitoring of AI regulations

Giziński Stanisław

The growing number of AI applications, also for high-stake decisions, increases the interest in Explainable and Interpretable Machine Learning (XI-ML). This trend can be seen both in the increasing number of regulations and strategies for developing trustworthy AI and the growing number of scientific papers dedicated to this topic. To ensure the sustainable development of AI, it is essential to understand the dynamics of the impact of regulation on research papers as well as the impact of scientific discourse on AI-related policies.

This paper introduces a novel framework for joint analysis of AI-related policy documents and eXplainable Artificial Intelligence (XAI) research papers. The collected documents are enriched with metadata and interconnections, using various NLP methods combined with a methodology inspired by Institutional Grammar. Based on the information extracted from collected documents, we showcase a series of analyses that help understand interactions, similarities, and differences between documents at different stages of institutionalization.

To the best of our knowledge, this is the first work to use automatic language analysis tools to understand the dynamics between XI-ML methods and regulations. We believe that such a system contributes to better cooperation between XAI researchers and AI policymakers.

Elevator pitch I + Poster session I

SUCCESSful data visualization using International Business Communication Standard

Sawicki Bartosz, Ułasik Kinga

International Business Communication Standard (IBCS) contains practical proposals for the design of business communication. It complies with the rules of the seven areas that form the acronym SUCCESS (Say, Unify, Condense, Check, Express, Simplify, Structure). Until now, no open source tools implementing the IBCS in R were available. We created an R package, which facilitates creating IBCS compliant charts. Since the charts are generated using Scalable Vector Graphics (SVG), they can be easily embedded in HTML documents. Moreover, the package could be useful in reports unification.

triplot4python: the remedy for dealing with correlated features in explanations

Krzyziński Mateusz, Żółkowski Artur

Many commonly used explainable artificial intelligence (XAI) methods for estimating feature importance are problematic as they ignore dependencies between variables, often assuming their independence, which leads to unrealistic settings and misleading explanations. To fill this gap, we propose an extended Python version of the triplot R package (K. Pękala, P. Biecek, K. Woźnica). It is a collection of methods that use information about associations between features. triplot4python enables interactive analysis of triplot (i.e., a new type of explanatory visualization) and also ensures that all variables are taken into account, including categorical ones.

The medLIME algorithm
Grudzień Adrianna

The medLIME algorithm is an explanatory method based on image perturbations. Its prototype was the LIME algorithm - but not without significant drawbacks, especially in the context of medical imaging. The superiority of the medLIME algorithm is primarily the ability to freely select the areas that we want to analyze, as well as the aforementioned perturbations, thanks to which we can compare with the original image, and thus better understand which features have a significant impact on the prediction of the model.

Multitasking and transfer learning capabilities in Deep Learning
Kałuska Maria

The aim of the project is to check the impact of additional tasks and transfer learning on effectiveness of the network. Initially, the network in question performed three tasks: reconstruction, classification and segmentation; it was then extended to the task of detection and more detailed segmentation by using a modified version of Masked RCNN with Unet as backbone. The project aims to answer the question whether, thanks to multitasking and transfer learning, it is possible to train the network to detect various covid changes on a very small set of 80 photos.

Elevator pitch II + Poster session II

Guide through jungle of models!
forester: An R package to automatically select between tree-based models
Hoang Thien Ly, Szmajdziński Szymon

Designing a machine learning model for a specific task is an arduous, time-consuming process. To simplify this process, we introduce the R package forester that offers tools to automatically test various tree-based models without pre-processing the data. An extension of our package is well connected with DALEX package, which provides metrics and explanations about the best models. In robust versions of the forester package, we will add feature engineering and hyperparameter tuning functions.

FairPANs - bringing fairness to neural networks
Ruczyński Hubert

The main topic of this study is the implementation and further research in the area of obtaining fair tabular data classifiers with the use of neural networks. To obtain such results, we modify the idea of GANs (Generative Adversarial Networks) by swapping the generator with the classifier and adapting the adversarial to recognize the label of a sensitive value. This way, PAN (Predictive Adversarial Network) should bring us much more fair predictions. In result, we present a mitigation technique suitable for neural networks and explore this field even more.

metaMIMIC: an analysis of hyperparameter transfer possibilities for tabular data using MIMIC-IV database
Grzyb Mateusz, Trafas Zuzanna

Transfer learning (TL) is a machine learning (ML) research problem concerning applying knowledge gained while solving past ML tasks to new ones. TL is leveraged mostly when considering neural networks, computer vision, and natural language processing. But what about simpler ML models, the ones based on tabular data? In our work, we examine hyperparameter transfer possibilities for tree boosting models. To achieve this, we create a benchmark of similar problems from the medical domain based on the MIMIC-IV database, where the same set of features is used to predict different targets. On this dataset, we evaluate multiple XGBoost hyperparameter sets and compare the results between different tasks. Then we repeat the procedure for the results obtained on diverse problems available through the OpenML website. The performed analysis shows that TL is possible even for tabular data,