MACHINE LEARNING AND DEEP LEARNING APPROACHES ON STUDENTS' SOCIAL MEDIA ADDICTION

Using social media too much by students has become a concern because it might hurt their progress in school, their minds, and their general health. It examines how many machine learning and deep learning models can predict and classify a student's social media addiction using demographic details, social media actions, and the record's outcome measuring sleep and grades. The data came from many countries and different levels of education, and this was processed further to handle gaps and change categorical information into numbers. The missing Addicted_Score was broken down into three groups called low, medium, and high. The data was scaled for features and divided into 80% for training and 20% for testing to get it ready for model building. The analysis looked at eight models such as LightGBM, CatBoost, SVM, Gradient Boosting, XGBoost, XGBoost+CNN, CNN+SVM, MLP, and Vision Transformer.With a test accuracy of 0.9858 and training time of 40.1489 seconds, LightGBM performed the best, followed by CatBoost with an accuracy of 0.9929- and 133.8106-seconds training time. Vision Transformer is accurate (0.9787), like most of the algorithms, but it finished the analysis in the least time (10.5932 seconds) and had slightly less specificity (0.9808). Integrating various layers in these hybrid approaches helped them process the data more effectively and extract essential features from the tabular information. During implementation, the following libraries were installed (keras-tuner, catboost, optuna) and TensorFlow and scikit-learn were used. Hyperparameter optimization using Optuna increased the achievements of the LightGBM model. The experiments reveal that using an ensemble or a hybrid model works better than relying only on DL in this situation, probably because the data is arranged in a structured form. The study points out how ML and DL may assist in determining which students are likely to struggle in their learning and how to help them. To improve the model and resolve some of its drawbacks, future studies may study very large datasets or look at real-time data.

Keywords: Social media addiction, ML and DL, Student Performance, Acadamic Impact, Mental Health