Smartphone Addiction Prediction Using Machine Learning

IEEE BASE PAPER TITLE:

Machine Learning Prognosis for Smartphone Dependency

IEEE BASE PAPER ABSTRACT:

Concern over smartphone addiction has grown recently as more and more people show signs of addiction, including compulsive phone use, decreased productivity, and even physical and mental health issues. Consequently, a growing necessity exists for the creation of efficient tools to forecast smartphone addiction and pinpoint individuals susceptible to this behavior. The proposed model is crafted to predict smartphone addiction using data collected from a survey of individuals who use smartphones. The survey encompassed inquiries related to demographics, phone use patterns, and various psychological aspects like anxiety, depression, and stress. a popular and effective machine learning method, to build our model. After pre-processing the data, the model is trained and its performance assessed by its accuracy, to see whether the model could be learned efficiently. Our findings demonstrated how effective the recommended treatment was at preventing smartphone addiction. Key features crucial for predicting addiction included patterns of phone use, such as the frequency of checking notifications, daily hours spent on the phone, and the predominant types of frequently used apps. Other important factors included age, gender, and stress levels. Our designed model has multiple possible uses. The solution finds its usage by healthcare professionals to identify individuals prone to potential risks of developing smartphone addiction

and provide appropriate interventions. It could also be used by app developers to design apps that are less addictive and promote healthier phone use habits.

OUR PROPOSED ABSTRACT:

Smartphone addiction has become a growing concern in today's digital era, where excessive mobile phone use impacts mental health, productivity, and social interactions. Addressing this issue, the "Smartphone Addiction Prediction Using Machine Learning" project aims to identify individuals at risk of addiction based on their usage behaviors and psychological patterns. The project is developed with the objective of identifying individuals prone to smartphone addiction based on various behavioral, psychological, and usage patterns. The system utilizes Python for backend coding, while the frontend is built using HTML, CSS, and JavaScript. The web framework employed is Flask, which ensures a smooth interaction between the client interface and the backend server, providing a seamless user experience.

The dataset used for this project comprises 501 records with 21 attributes, which include survey responses focused on phone usage patterns and addiction-related behaviors. These attributes range from questions about daily phone habits, such as taking the phone to social gatherings or frequently checking it without notifications, to more serious indicators of addiction like anxiety over losing the phone or relying on it in awkward situations. The target attribute classifies users into two categories: addicted (Yes = 1) and not addicted (No = 0), providing a clear objective for the prediction models.

Three machine learning models were utilized to build the prediction system: Stacking Classifier, CatBoost Classifier, and ExtraTrees Classifier. The Stacking Classifier model, which combines the predictions of multiple base learners through

a meta-learner, achieved a Training Accuracy of 100% and a Test Accuracy of 94%. This model benefits from integrating several algorithms, offering improved prediction capability by reducing biases inherent to single-model approaches.

The second model, CatBoost Classifier, is particularly effective for handling categorical data and is known for its performance on complex datasets. It achieved a Training Accuracy of 99.84% and a Test Accuracy of 96.12%. Its gradient boosting approach enables it to work efficiently with categorical features present in the dataset, delivering strong results in terms of prediction accuracy.

Finally, the ExtraTrees Classifier model outperformed the others, with a Training Accuracy of 99.84% and a perfect Test Accuracy of 100%. This ensemble learning method builds multiple decision trees and aggregates their results to improve accuracy and prevent overfitting. Its robustness and generalization ability made it the most suitable model for this dataset.

The overall system developed in this project offers a valuable tool for healthcare professionals and mobile app developers to assess smartphone addiction tendencies in individuals. By accurately identifying those at risk, the project provides a foundation for potential interventions and personalized recommendations, addressing the growing concern of smartphone addiction in the modern digital age.

SYSTEM REQUIREMENTS:

HARDWARE REQUIREMENTS:

- System : Pentium i3 Processor.
- Hard Disk : 500 GB.

- Monitor : 15'' LED.
- Input Devices : Keyboard, Mouse.
- Ram : 8 GB.

SOFTWARE REQUIREMENTS:

- Operating System : Windows 10 / 11.
- Coding Language : Python 3.12.0.
- Web Framework : Flask.
- Frontend : HTML, CSS, JavaScript.

REFERENCE:

Anitha Julian, Prathima S, "Machine Learning Prognosis for Smartphone Dependency", 2024 International Conference on Computing, Power, and Communication Technologies (IC2PCT), IEEE Conference, 2024.