AI-DRIVENAGEDETECTIONAND DYNAMIC SCREEN TIME CONTROL SYSTEM FOR CHILD SAFETY

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Abstract—**The rapid advancement in digital technologies and smart devices, screen time has become a prevalent issue in children. Although digital media have educational and entertainment value, screen over-use has emerged as a significant issue with negative impacts on children's physical, cognitive and social development. Existing parental control methods involve manual monitoring and fixed limits, which do not consider specific user patternsandagevariations.Inthisstudy,wepresentanAI-drivenagedetectionandscreen time dynamic control system for improving child safety. It employs computer vision and deep learning methods to automatically classify the user's age category from facial images and adapt screen time restrictions and content filters based on the user's age. The system, which combines real-time monitoring, intelligent decision-making and adaptive control, enablesadaptivecontrolpoliciesfordeviceusage.Theexperimentsshowthatthesystemis effective in curbing excessive screen time while providing convenience and enhancing digital safety for children.**

I. Introduction

The omni presence of mobile phones,tablets and computers has revolutionised's interactions with technology. Children use digital devices for a wide range of activities, including online learning, plays and social networking. While technology is essential for education and communication, excessive device use has been associated with numerous problems such as eye strain,sleeping problems,lackofphysicalexerciseandbehavioural problems. Parents are faced with challenges in controlling their children's use of digital devices because of time constraints and a lack of technology.

Current parental control appsare limited in capabilities,offering only basic restrictions like time restrictions and content filters, without intelligence and adaptability. They need to be configured and cannot adapt to the user's age or behaviour. This can lead to children circumventing controls or not reducing their screen time. A smart system is needed to automatically monitor users, identify their age and apply screen time regulations without parental guidance.

The present study proposes an artificial intelligence (AI) system that integrates age recognition and dynamic screen time regulation.

The system leverages machine learning techniques to detect the user's age and automatically apply age-appropriate screen time policies. The system's automatic monitoring and control feature will help ease the pressure on parents and enable safe digital device usage for children.

II. RELATED WORKS

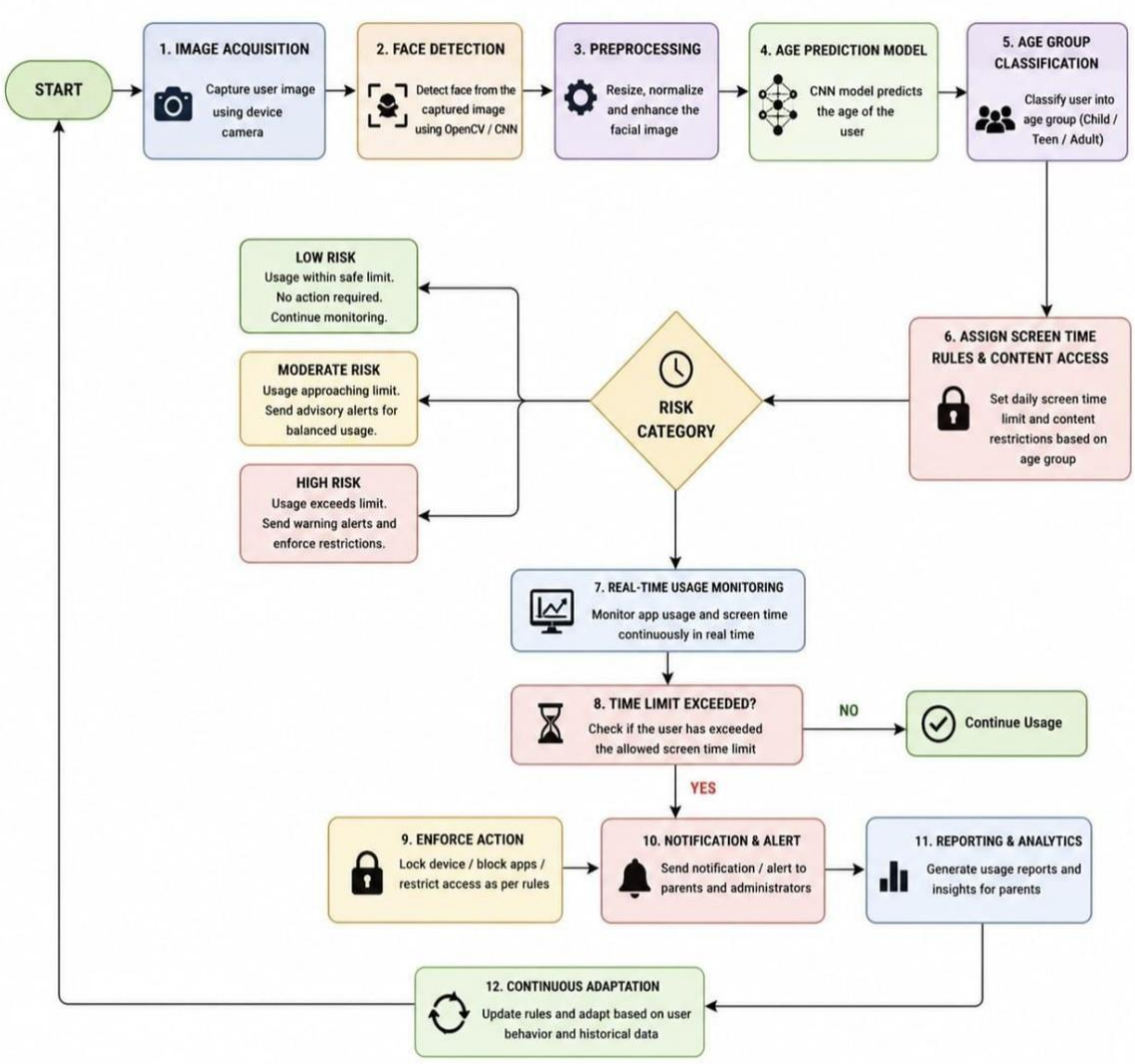
The problem of excessive screen time in children has been extensively explored, and this has resulted in the development of parental control and monitoring tools. These conventional methods typically involve settingti meconstraintsand content filtering.These approaches are rudimentary and do not take into account

user variability.With advancements in intelligence and computer vision, smart systems are now able to monitor user behavior and facial characteristics. A number of research studies have investigated age estimation from facial images usingmachine learning algorithms. These models generally employ convolutional neuralnetworks(CNNs) to extract facial features and estimate age. But these systems are generally developed as research tools and not deployed in practical systems for child protection.

III. METHODOLOGY

The system is set up to automatically determine the user's age and adjust screen time. The system follows a series of steps involving image extraction,face recognition,age prediction, classification and adaptive control. Each step is crucial for proper detection and control of screen time.

System Operational Flow chart



Age Detection Model

The age detection model uses a Convolutional Neural Network, a form of deep learning model commonly used for image processing. It is made up of severall ayersthatcollaborate to identify the features of

the image. These features include facial shape, skin texture and other visual cues for age estimation.

Adaptive Screen Time Management

Based on the user's age, the system enforces screen time limits. Children have limited screentime,withrestrictionsoncertaincontent.Adolescentsenjoyadegreeoffreedom, and adults enjoy the least restrictions.

IV. RESULTS AND DISCUSSION

The proposed system was tested using a combination of official image data sets and simulated device usage scenarios.The age detection model achieved high accuracy,demonstrating the effectiveness of deep learning techniques in predicting age. The system successfully classified users into appropriate age groups and applied corresponding restrictions.

V. CONCLUSION

This paper proposed an AI-powered system for age detection and dynamic screen time management to improve child safety. Through the integration of computer vision, deep learning and real-timeanalysis, the system of efficiency-efficient and automated approach to device control.

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