ISSN (Online): 3139-7689

Available online: www.ijsrmes.com

International Journal for Scientific Research in Modern Engineering and Science

Published in Conference Special Issue: Vol. 1, Special Issue 1, pp. 257–264, 2026

AN AI-BASED SYSTEM TO LIMIT SHORT-FORM VIDEO SCROLLING AND REDUCE MINDLESS SCROLLING ACROSS MULTIPLE PLATFORMS

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Abstract

Short-form video platforms have grown rapidly in recent years and changed the way people consume digital content. Earlier social media platforms mainly focused on photos or longer videos, but the introduction of short, quickly consumable videos created a new style of online interaction. A major turning point in this trend came with the rise of TikTok, which popularized the idea of continuously scrolling through short videos that instantly adapt to user preferences. Following its success, other platforms such as YouTube Shorts and Instagram Reels introduced similar features. These platforms provide an endless stream of content where new videos appear immediately after each swipe, keeping users highly engaged.

This type of unintentional or mindless scrolling can negatively affect productivity, focus, sleep patterns, and daily routines. The issue has become particularly noticeable among students and younger users, who often open short-form video applications for quick entertainment but end up scrolling for much longer than planned. To address this problem, this study proposes an AI-based system designed to monitor and limit short-form video scrolling across multiple platforms.

The system observes how users interact with short-video feeds and measures the time spent scrolling during each session. When a predefined daily scrolling limit is reached, the system temporarily restricts further scrolling while still allowing access to other important features. By identifying scrolling patterns and encouraging controlled usage, the proposed approach aims to promote healthier and more balanced digital behaviour.

Keywords: *Mindless Scrolling; Short-Form Video Platforms; Screen Time Control; Artificial Intelligence*

1. Introduction

In recent years, the way people spend their time online has changed dramatically. Social media platforms are no longer used only for communication or sharing updates; they have become one of the main sources of entertainment for millions of users around the world. Among the many forms of digital content, short-form videos have become especially popular because they are quick, engaging, and easy to consume. With just a few seconds of attention, users can watch multiple videos in a short period of time. This type of content fits perfectly into modern lifestyles where people often look for fast and easily accessible entertainment [1].

The concept of short-form video content did not appear suddenly; it evolved gradually with the development of social media platforms. One of the earliest platforms to popularize very short videos was Vine, launched in 2013, which allowed users to create and watch looping videos of only six seconds. Despite its short lifespan, Vine demonstrated how quickly users could consume and share brief video clips. The real turning point came later with the global rise of TikTok around 2018, which introduced a personalized "For You" feed that continuously recommended short videos based on user interests [2]. This design made it extremely easy for users to keep scrolling and watching new content without interruption. Following TikTok's success, other major platforms adopted similar formats. Instagram introduced Reels in 2020, and YouTube launched YouTube Shorts in 2021, both offering vertically scrolling videos designed to capture user attention within the first few seconds. Today, most major social media platforms follow this approach, where users often decide within just a few seconds whether to continue watching a video, making short-form video one of the fastest and most engaging forms of digital content consumption.

Although these platforms provide entertainment and creative opportunities, their design also encourages users to keep scrolling for long periods of time. Since new videos appear instantly after every swipe, users often continue watching content without realizing how much time has passed. Many people open these applications for a few minutes of relaxation but eventually spend far more time than they originally planned. This behaviour is commonly referred to as mindless scrolling, where users repeatedly watch content without a clear purpose [3].

The problem is particularly noticeable among students and young users who frequently access these platforms during study time or late at night. Continuous exposure to short and rapidly changing content can reduce attention span and distract users from important tasks. Over time, excessive scrolling may affect productivity, sleep patterns, and overall digital well-being [4].

To address this growing issue, there is a need for smarter tools that can help users manage their screen time more effectively. This research proposes an Artificial Intelligence–based system designed to monitor short-form video scrolling behaviour and limit excessive usage across multiple platforms. The system analyses user interaction patterns within short-video feeds and applies intelligent usage limits when excessive scrolling is detected. The goal of this approach is to encourage more mindful and balanced use of short-form video applications while still allowing users to access other useful platform features.

2. Related Work

Short-form video has become one of the most popular forms of online content in recent years [5]. Early studies on short video platforms explored how very short videos could quickly capture user attention and encourage frequent content consumption. Research on platforms such as Vine showed that short looping videos allowed users to watch many pieces of content within a short period of time, making the format highly engaging and easy to consume for viewers.

As short-form video platforms evolved, researchers began examining how recommendation systems influence the way users interact with video feeds [6]. Montag and Hegel ich [3] discussed how modern platforms use algorithms to continuously suggest new content based on user preferences and viewing patterns. These recommendation

systems help users discover new videos but can also encourage repetitive scrolling behaviour where users continue watching content without actively deciding what they want to watch, which may gradually increase overall screen time.

With the rapid global growth of TikTok, several studies started focusing specifically on short-form video consumption patterns. Kaye et al. [2] analysed the development of TikTok and explained how its personalized "For You" feed delivers a continuous stream of short videos tailored to each user. Following TikTok's success, similar short-form video features were introduced by other major platforms such as Instagram Reels and YouTube Shorts. Recent studies [1] show that these features have quickly become one of the most widely used forms of online content, especially among younger users and mobile audiences who spend a large portion of their time on short video feeds.

However, most existing digital well-being tools mainly measure overall screen time and provide simple usage reports or daily time limits [7]. They do not specifically monitor scrolling behaviour within short-form video feeds or analyze how users interact with short-video content [8]. As a result, users may continue scrolling through videos even when they are aware of their screen time. The system proposed in this research focuses specifically on short-form video scrolling behaviour by analysing scrolling patterns and usage duration to identify excessive scrolling and apply intelligent usage limits while still allowing access to other useful platform features and normal application functions.

3. Methodology

3.1 System Overview

Short-form video applications provide users with a continuous stream of content where new videos appear instantly after each scroll [9]. While this design makes the platforms highly engaging, it can also encourage users to keep scrolling for long periods without realizing how much time they have spent [1]. Many users open these applications for a short break but eventually continue watching videos for longer than they initially planned, a behaviour commonly associated with mindless scrolling [3].

To address this issue, this research proposes an AI-based system designed to monitor and manage short-form video usage across multiple platforms. The system observes how users interact with short-video feeds and records scrolling behaviour during each session. By analysing usage patterns such as continuous scrolling and extended viewing time, the system can identify excessive usage. When a predefined usage limit is reached, the system temporarily restricts further scrolling while still allowing access to other useful features of the application, encouraging healthier and more balanced digital habits.

3.2 System Architecture

This section describes the overall structure of the proposed system and how different components work together to monitor and manage short-form video usage. The system is designed to observe user interaction with short-video platforms, analyze scrolling behavior, and apply intelligent limits when excessive usage is detected. Similar monitoring approaches have been discussed in digital well-being research that aims to understand user

interaction patterns and reduce excessive screen usage [3]. The overall architecture of the proposed system is illustrated in Fig. 1.

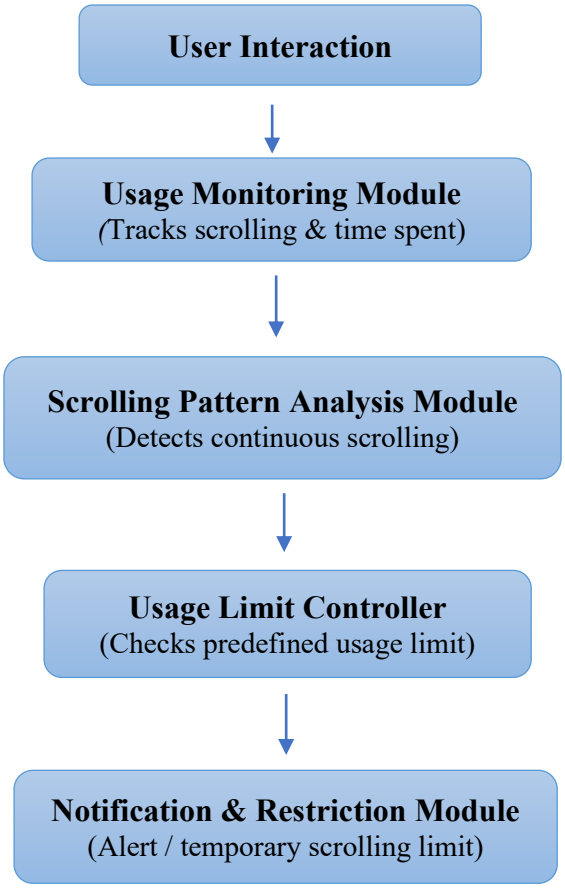

Fig. 1: Architecture of the Proposed Short-Form Video Monitoring System

The architecture shown in Fig. 1 consists of several interconnected modules that work together to monitor and manage short-form video usage [10]. The process begins with user interaction, where individuals browse short-form video platforms and continuously scroll through recommended content. This interaction data is captured by the usage monitoring module, which records behavioral indicators such as scrolling frequency and the time spent watching videos.

The collected data is then processed by the scrolling pattern analysis module, which analyzes user activity to detect patterns associated with continuous or excessive scrolling [3]. Based on this analysis, the usage limit controller compares the detected activity with predefined usage thresholds. If excessive usage is identified, the notification and restriction module is activated. This module alerts the user and may temporarily limit further scrolling while still allowing access to other application features. Through this architecture, the system helps encourage healthier and more balanced digital usage habits without completely restricting platform access.

3.3 Usage Monitoring and Data Collection

The usage monitoring module tracks user interaction with short-form video applications in real time using digital well-being monitoring techniques. The system collects behavioral indicators such as scrolling frequency, viewing duration, and session length through application usage statistics and background activity tracking available in

modern mobile operating systems. These monitoring functions record how long users remain within short-video feeds and how frequently they scroll between videos, allowing the system to observe continuous scrolling behaviour and capture engagement patterns commonly used in intelligent screen-time monitoring systems [10].

The collected data is temporarily stored and processed using Python-based data analysis to identify patterns related to excessive scrolling. Metrics such as scrolling duration and session continuity are analysed, and a lightweight threshold-based AI method compares these values with predefined usage limits to distinguish between normal browsing and excessive scrolling behaviour before forwarding the results to the scrolling pattern analysis module.

3.4 Scrolling Pattern Analysis

The scrolling pattern analysis module examines user interaction data collected during the monitoring stage to identify patterns of continuous or excessive scrolling behavior. The detection process used by the system is illustrated in Fig. 2.

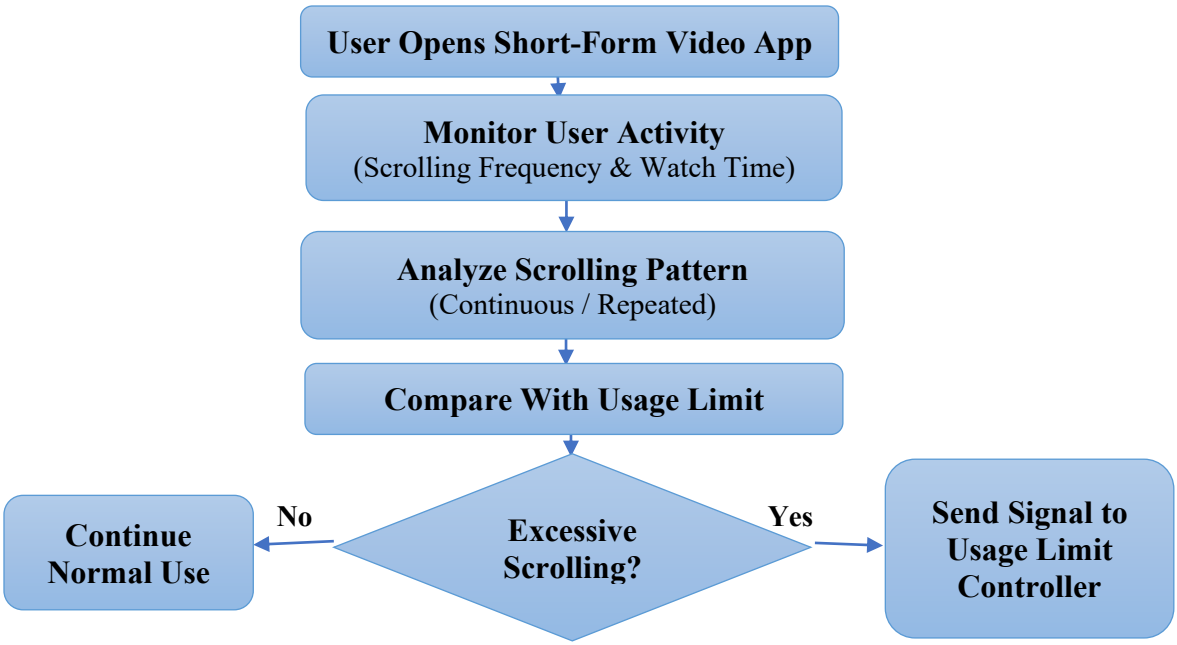

Fig. 2: Process of Detecting Continuous Short-Form Video Scrolling

As shown in Fig. 2, the system first observes user interaction with the short-form video application and records behavioural indicators such as scrolling frequency and watch time. These indicators provide useful insights into how users engage with video feeds and help the system detect patterns associated with repetitive or prolonged scrolling behaviour [3].

The collected activity data is analyzed to determine whether the user's scrolling behavior exceeds predefined usage thresholds. Continuous scrolling without noticeable pauses over an extended period may indicate that the user is spending more time than intended on the platform. When such patterns are detected, the system sends a signal to the usage limit controller for further evaluation. Based on this evaluation, the system may trigger notifications or temporary usage restrictions, encouraging users to maintain healthier and more balanced digital habits.

3.5 Usage Limit Control and Notification

The usage limit control module manages short-form video consumption after excessive scrolling behavior is detected. Behavioral indicators such as session duration, scrolling frequency, and interaction continuity are evaluated using a lightweight threshold-based decision model implemented in Python. The measured values are compared with predefined daily usage limits configured by the user. When the activity exceeds the defined threshold, the system activates the notification and restriction mechanism.

The notification mechanism uses mobile operating system notification services to inform the user that the scrolling limit has been reached. After the alert, the system temporarily restricts additional scrolling within the short-video feed by introducing controlled delays in the session. Unlike strict application blocking, other platform features remain accessible, helping reduce excessive scrolling while maintaining normal application usability.

4. Results and Discussion

The effectiveness of the proposed monitoring system was evaluated by comparing typical short-form video usage with and without the scrolling control mechanism. The evaluation focused on how continuous scrolling behavior changes when usage monitoring and limit enforcement are applied. In a typical scenario without the monitoring system, users spend a significant amount of time scrolling through short-form video feeds during a single session. When the proposed system is active, scrolling patterns are continuously monitored and controlled through predefined usage limits. This comparison provides a clear indication of how the monitoring approach can influence user behavior and reduce prolonged engagement with short-form video content. The overall impact of this comparison is illustrated in **Fig. 3**.

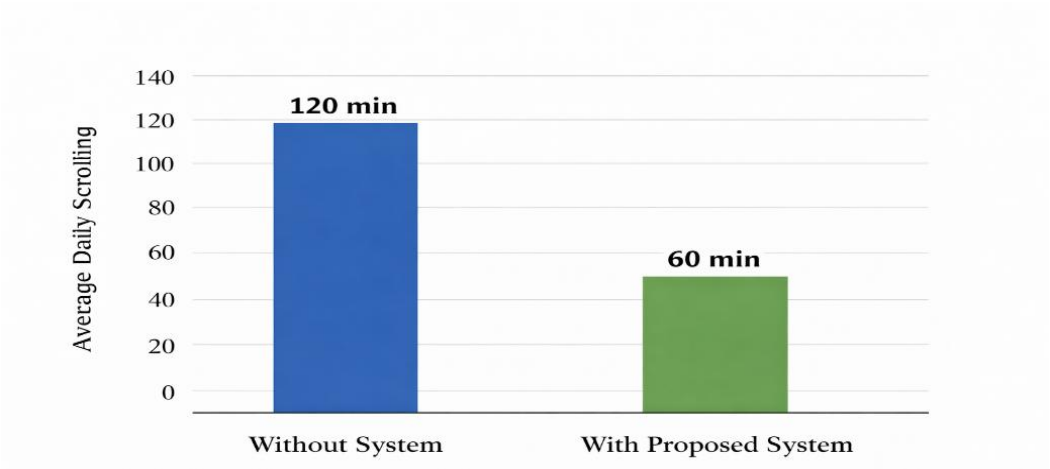

Fig. 3: Reduction in Short-Form Video Scrolling Time Using the Proposed System

As shown in Fig. 3, the implementation of the proposed system results in a clear reduction in short-form video scrolling time. The average daily scrolling duration decreased from 120 minutes to 60 minutes, representing nearly a 50% reduction in excessive usage. This improvement indicates that monitoring scrolling patterns and applying controlled usage limits can effectively interrupt prolonged browsing sessions that often occur unintentionally.

Reducing approximately 60 minutes of scrolling per day can have a meaningful long-term impact on digital time management. Over the course of a year, this reduction corresponds to nearly 21,900 minutes, or about 365 hours, which is equivalent to more than 15 full days of time that might otherwise be spent on continuous short-form video consumption. These findings highlight the potential of AI-based monitoring systems to encourage healthier digital habits while still allowing balanced access to social media platforms.

5. Conclusion

Short-form video platforms have transformed how people consume digital content, but their continuous scrolling design often leads to excessive and unintentional screen time. This research presented an AI-based monitoring system that analyzes user interaction patterns such as scrolling frequency, viewing duration, and session activity to detect prolonged scrolling behavior. By identifying continuous scrolling patterns and applying controlled usage limits, the proposed approach helps users become more aware of their digital habits without completely restricting access to social media platforms.

The experimental results indicate that the system can significantly reduce excessive scrolling behavior, decreasing average daily usage from 120 minutes to 60 minutes, representing nearly a 50% reduction. This improvement can save approximately 365 hours of time per year, which can be redirected toward productive activities. These findings highlight the advantage of AI-based behavioral monitoring systems in promoting healthier digital habits while maintaining balanced access to modern social media applications.

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