FlashGuard: Developing Epileptic Activity and Trigger Content Detection Software Using a Computer-Based Application for Real Time Monitoring and Seizure Reporting

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In the virtual realm, individuals with photosensitive epilepsy encounter challenges using electronic devices exposed to visual stimuli. These stimuli, characterized by rapidly flashing elements in high contrast, can trigger seizures, rendering the Internet and computer applications unpredictable and hazardous for affected individuals. To address this issue and enhance accessibility, a novel approach was devised to assess the average rate of frame changes on a user's screen. This innovative method involves converting frames to the CIELAB color space, replicating human perceptual qualities, and calculating the average grayscale of the resulting differential frame. The weighted average of the last 30 differentials is then fed into a logistic regression model embedded in FlashGuard, the compiled application. Unlike browser extensions, FlashGuard is compatible with all computer applications and provides real-time analysis, surpassing current models that rely on recorded data. During testing, FlashGuard demonstrated an 80% accuracy and a 76% precision in identifying True Positives for seizure-inducing videos. Anticipated to be more effective in real-world scenarios with more variation in virtual environments, FlashGuard serves as a proactive solution, preempting seizure-inducing stimuli and thereby increasing device accessibility for photosensitive individuals. This application acts as a safety barrier, allowing users to engage with devices while mitigating the risks associated with potentially harmful stimuli.