The Desensitization Station: A Comprehensive Interface for Accessible Video Content - Project Abstract

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ABSTRACT

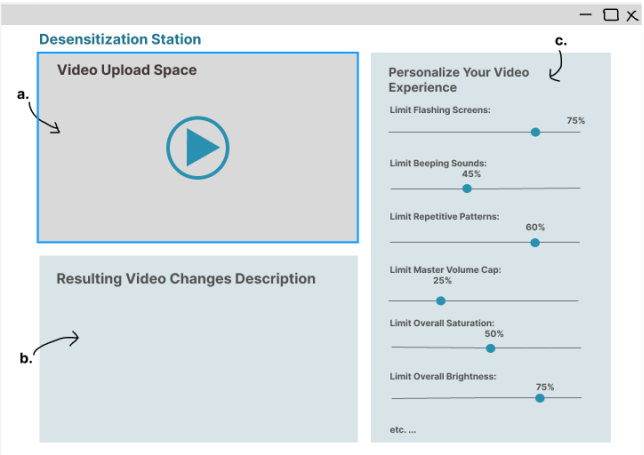

Figure 1: This is a wireframe mock-up of our interface system. There are three important segments relating to the functionality: a.) a space for users to upload their videos and preview video content, b.) a text section to describe the effect that the user's dial selections will have on the resulting video, and c.) a set of sliding dials to enable the user to personalize their video to their specific needs

As the amount of video content available to stream across a variety of platforms both on and offline has increased dramatically over the past 10 years [3], accountability for providing safe and accessible media for all users is paramount. However, there is a noticeable lack of accessibility for neurodivergent and photosensitive users within these platforms, effectively alienating a significant community of viewers and perpetuating a standard of exclusion in digital media. In response to this issue combined with the ever-evolving media landscape, we propose the creation of a centralized and user-friendly interface designed to enhance the accessibility of video content. Simply having a way to control common causes of sensory distress would open up a new world of content for these users while promoting the importance of equal accessibility for all.

It is estimated that anywhere from 2% - 14% of people with epilepsy can have visually induced seizures, affecting up to 9 million users. This large amount of users are consistently at risk when viewing online material, as the diverse content on the internet is impossible to predict [2, 7]. Similarly individuals with Autism Spectrum Disorder (ASD) experience, on average, higher sensitivities visual and auditory stimuli [5, 6]. Visuals and sounds that are sudden, constant, or repeated have been shown to directly affect persons with ASD to a higher degree than a control group [4]. According to the Center of Disease Control and Prevention, approximately 1 in 36 children are identified as having some level of ASD. Despite this significant minority, little work has been done to improve online accessibility for common ASD sensitivities.

Past research on photosensitive user accessibility has focused specifically addressing user safety through higher quality annotations [1] and active monitoring of user content [7]. While this work has made strides in accessibility for epileptic users, it has opened an area of research aimed at other populations of users with differing sensitivities both in source and intensity. Therefore, the research goals of this project are to provide a tool that can be used by users of all backgrounds, not only persons with epilepsy. Using prior work in detection and prevention to inform our design decisions, we focus on extending the ideas of safety towards user comfort while encompassing as many users' needs as possible.

With this goal in mind, we implement a new interface to give users more control over their viewing experience, providing tools to customize various aspects of their content, as shown in Figure 1. Hence, individuals will have the ability to limit the maximum brightness, maximum volume, intensity of flashing video or quick color changes, color repetition, and more, all within one small, unobtrusive interface. Ideally, the interface will act as a companion for a user as they browse the internet, however we will more likely provide a prototype for proof-of-concept. The prototype will allow users to provide a video link of their choosing and then play the video through a web-based program.

Through a comprehensive user study held on a demo website, we will test the effectiveness of our video filtering interface in several categories: ease of use, impact on viewing experience, and overall user satisfaction. This study will involve collecting feedback from users while watching several video examples, first without and then with the aid of our interface. We may use the data set provided from a previous study [7] as testing material, as it has been hand curated and annotated by previous researchers. The data set includes gifs/videos that they have deemed might affect those

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with photo-sensitivities. Due to the goal of creating a general-user program, limited subject resources, and safety concerns, we will specifically recruit participants that do not have photosensitive epilepsy. By collecting data from the user study, we hope to gain valuable insight into both potential improvements to explore in future research as well as ways in which users will interact with our interface in practice, including general usability and accuracy of filters.

1 RELATED WORKS

The research within this paper is directly informed by work done within the accessibility field of HCI research especially as it relates to online accessibility for users with various disabilities.

1.1 Accessibility

Research by Laura South specifically targets increasing the safety of users with photosensitive epilepsy through preventative measures against possible seizure inducing content online [7]. Her previous research lays the groundwork for methods of determining what factors contribute to seizure inducing content as well as employing detection methods to prevent their circulation.

1.2 Sensitivity Source Detection

This paper also references two well-established systems for automatic detection of photosensitive risk factors: the Photosensitive Epilepsy Analysis Tool(PEAT)[1] and the Harding Flash and Pattern Analysis tool (HardingFPA)[2]. These existing tools serve as a touch-point for future detection method development.

KEYWORDS

Human-Computer Interaction, Neurodivergence, Photosensitivity, Accessibility, Digital Media

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[1] https://trace.umd.edu/peat/

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