



Flicker Fix: Detection and Mitigation of Strobing Effects in Media for Photosensitive People

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METHODOLOGY

Detection of Strobing Media Conditions:

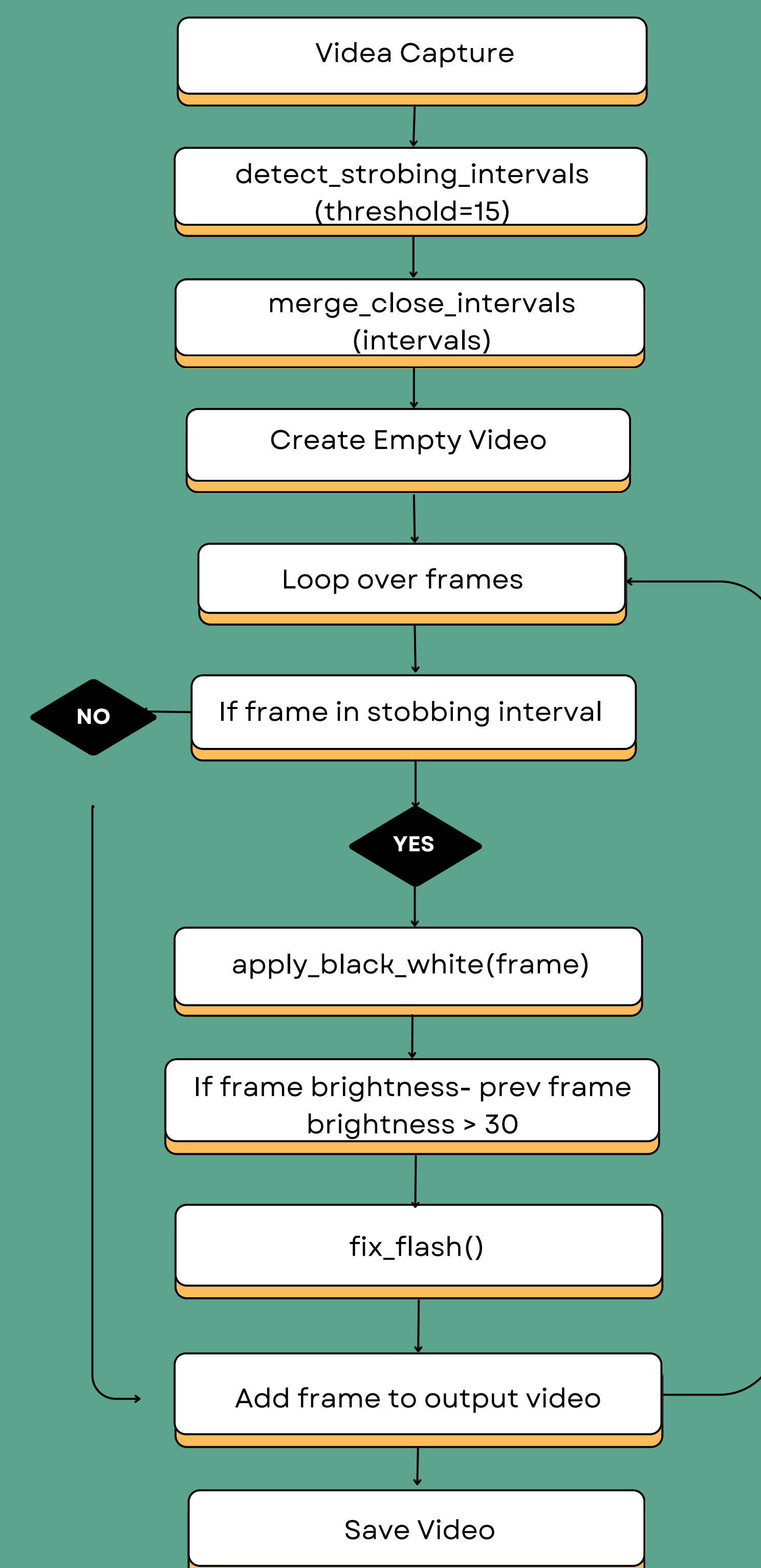
- The algorithm identifies conditions in video frames that can trigger seizures or discomfort.
- These conditions include rapid changes in brightness, contrast, or color intensity.

Mitigation Strategy:

- It transforms these frames into black and white to reduce visual intensity.
- It smoothens abrupt brightness shifts by calculating the average pixel brightness over time.

Integration with Slack Bot:

- The algorithm is implemented into a Slack bot.
- Users can add this bot to their Slack channels to ensure all shared media is processed to eliminate strobing effects, reducing the risk of discomfort or seizures.



INTRODUCTION

For individuals susceptible to photosensitive epilepsy, the experience of watching videos or playing games can pose significant risks due to strobing effects present in the content, by triggering seizures. Our project aims to develop a comprehensive system that can not only detect strobing effects in various types of media content but also mitigate the effects to empower users to navigate it safely.

What is Photosensitivity?

A condition in which certain individuals experience seizures, migraines, or other adverse health effects when exposed to flashing or strobing lights, patterns, or images.

Causes of photosensitivity

- Change in Intensity and Contrast
- Rapid Color Change
- Pattern Repetition
- Fast Moving Content

OUTCOMES AND SUMMARY

Before and After

Input Video shows a realistic example, where strobing effects can occur without a prior warning causing discomfort to photosensitive audiences. Our algorithm identifies high-risk frames with rapid brightness changes (as seen by the repeated peaks and troughs in the intensity chart) that can induce seizures or discomfort.

Output Video Transformation: Strobing effects are neutralized by converting to grayscale and smoothing brightness levels, significantly reducing visual stress.

Conclusion and Future Work

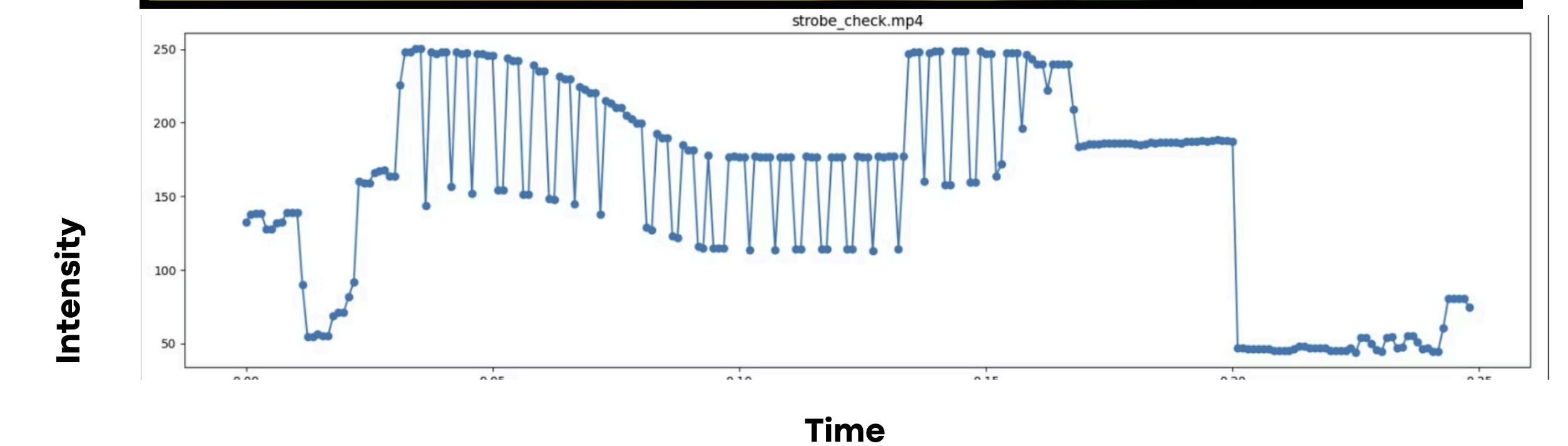
We have successfully detected and neutralized the strobing effect, integrating it into a Slack bot for enhanced accessibility. Moving forward, our future work includes making the algorithm real-time, developing a Chrome extension for YouTube videos with similar functionality, and exploring additional conditions thereby improving the efficacy and robustness of our current algorithm.

Behind the Video: Pokemon Shock

The infamous Pokémon episode "Dennō Senshi Porygon" induced seizures in over 600 Japanese viewers, sparking chaos and a worldwide ban after its single airing on December 16, 1997.



INPUT VIDEO



OUTPUT VIDEO

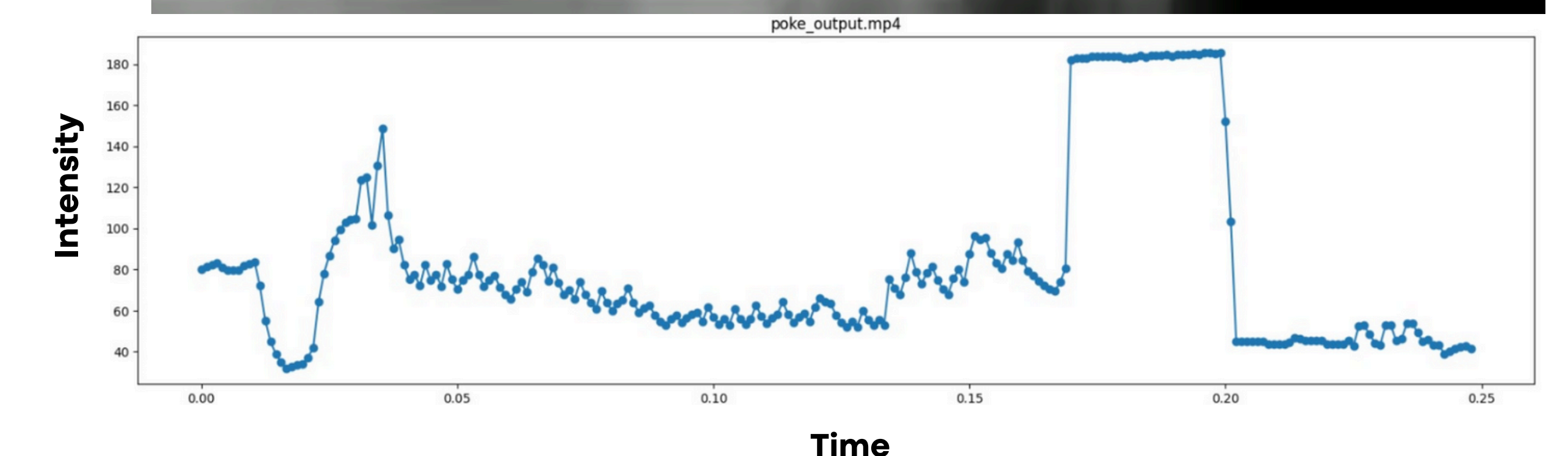


Image Source: Pokémon Episode [Dennō Senshi Porygon]
(used for informational purposes)