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Mitigation of Fear Triggers for Image Viewing in Virtual Reality

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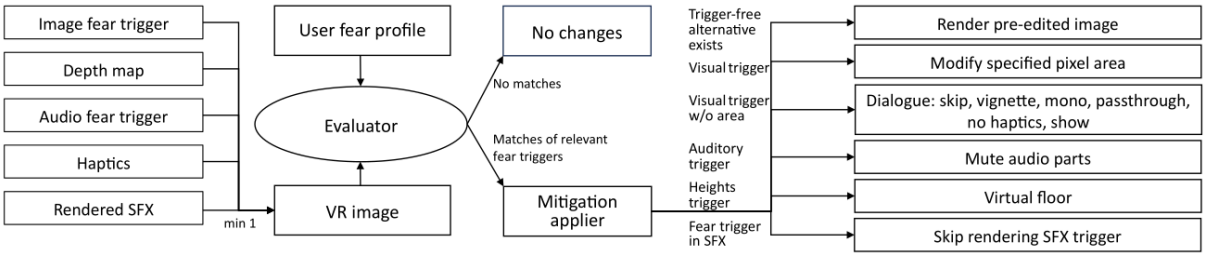

Figure 1: *Pipeline with inputs, evaluator, and applied fear mitigation strategies for VR image viewing.*

Abstract

Modern VR image viewers combine immersive photos with audio, special effects and haptics to provide a highly immersive experience. However, users with specific phobias may encounter discomfort while browsing through random images, specifically, considering the high presence in VR. We explore strategies to reduce fear triggers and implement tailored mitigation measures in our image viewing app, specifically for 3D and spherical images. We address automating fear reduction in different VR formats, audio, and special effects to improve the accessibility and experience for VR image viewer users with specific phobias.

CCS Concepts

• ***Human-centered computing*** → ***Virtual reality;***

1. Introduction

Photography for virtual reality (VR) allows to re-immerse into captured moments. However, sudden switches between unknown images are challenging for users with phobias. Our research focuses on minimizing the impact of fear triggers in VR images through various mitigation strategies (Figure 1). We investigate manual and automatic VR image modifications and suggest further usages of our work. **Our contributions are:** introducing user fear profiles, extending mitigation strategies in VR image viewing, offering new insights, conceptualizing automatic fear trigger removal, and creating an automated spherical image editing pipeline.

2. Related Work

Alsina-Jurnet et al. [AJGMRG11] found that subjects in a virtual environment responded with higher fear levels in fear-inducing situations with high realism. Subsequently, lowering presence could decrease anxiety when viewing images. Cummings et al. [CB16] highlighted the positive impact of wide field-of-view (FOV) and 3D content on presence. Hodges et al. [HRK*95] used virtual floors in VR therapy for the treatment of acrophobia. Applications and games render interactive 3D content, enabling content replacement based on user phobias. In captured images, we cannot alter the underlying 3D content. Pohl [Poh22] summarizes 13 mitigation strategies for reducing the impact of trigger elements in 2D, 3D and spherical VR media with special effects (SFX), audio and haptics to be used individually or combined. The proposed mitigation strategies are: remove media, reduce FOV, view image through moveable lens or fixed rotatable screen, blur/replace triggers, change content from 3D to 2D, lower volume of audio triggers, remove haptics, add virtual floor, change interpupillary distance, move user away from triggers (6-DoF media), mix in real-world surrounding.

3. Methodology

To improve VR viewing regarding fears, we employ selected mitigations from Pohl [Poh22] and introduce own concepts. Our Unity 2021.3 LTS app allows users to navigate through their images, enhancing them with two audio tracks and a special effect. We manually tag fear triggers in a file. A user profile allows selecting fears.