



asmVR: VR-Based ASMR Experience with Multimodal Triggers for Mental Well-Being

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ABSTRACT

Individuals are besieged by anxiety and stress throughout the world. Solutions to improve mental well-being can vary, and Autonomous Sensory Meridian Response (ASMR) is one potential method that has proven to be able to reduce stress. To that end, we introduce asmVR, a novel approach to enhancing ASMR experiences using multi-modal triggers. Combining online and offline modes, asmVR enhances ASMR tingling, offering immersive VR environments and remote ASMRtist embodiments. Initial user testing shows tingles enhance and stress relief potential, along with new possibilities for VR in psychological therapy.

CCS CONCEPTS

• Human-centered computing; • Virtual Reality; • Empathic computing;

KEYWORDS

ASMR, Virtual Reality, Tactile, Avatar, Multiplayer

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1 INTRODUCTION

Autonomous sensory meridian response (ASMR) is a sensory phenomenon in which individuals experience a tingle sensation to specific audio or video stimuli. Generally, these triggers induce a tingling sensation felt in the head and neck area of the individual [Barratt and Davis 2015]. Different individuals may experience varying tingling responses to distinct triggers. ASMR videos or

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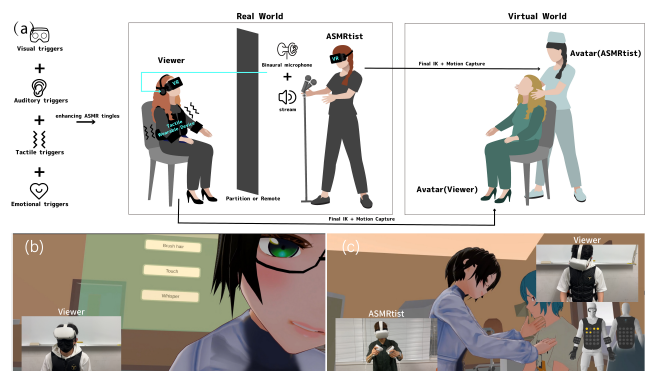


Figure 1: (a) System diagram of asmVR, (b) offline mode whisper experience, (c) real-time ASMRtist and viewer in online mode.

audio recordings serve as efficient tools for individuals to reduce heightened mental tension, providing a personal, accessible, budget-friendly, and non-contact mode of amusement. Immersed in ASMR, people empathize with roles, deepening emotional connections and understanding conveyed intentions — often involving personal attention, roleplay, and simulated social interactions. ASMR and trait empathy may have a positive correlation [McErlean and Banissy 2017]. So ASMRtists (ASMR artists) help their viewers effectively induce ASMR tingling by utilizing various triggers, creating a sense of intimacy, designing environments, role-playing, etc. [Niu et al. 2022] to convey a sense of intimacy.

Virtual reality (VR) has the potential to provide users with a sense of immersion and focus. The implementation of tactile feedback in virtual reality is crucial for enhancing the user experience [Pittera et al. 2019]. Therefore, we propose asmVR, a multimodal trigger VR-based experience to enhance ASMR tingles. This system aims to bridge the gap of intimacy between the ASMRtist and viewers by employing a comprehensive audio-visual-tactile feedback system. ASMRtist can empathetically engage with the viewer through personalized attention, roleplaying, and simulated social interactions [Niu et al. 2022].

2 DESIGN AND IMPLEMENTATION

2.1 Pilot Workshop

We organized an online workshop with seven ASMR enthusiasts (5 females, aged 20-30) to design asmVR for ASMR experiences. The results: (1)Interviews showed a preference for terms like friction, tapping, whispering, and other terms related to human-body interaction. (2)Tactile triggers, like ASMRtists touching objects, induced tingling in viewers through empathy, though creating realistic vibrations was challenging.

2.2 Multimodal ASMR triggers

We developed asmVR using the Unity game engine¹ and employed the Meta Quest 2² to map the full body motion with the user's corresponding virtual avatars. Subtle tactile sensations were surreptitiously conveyed to the upper torso and arms using the integrated capabilities of the bHaptics Tactsuit³. Also, We used the binaural microphone to capture and broadcast binaural ASMR audio of exceptional quality. asmVR is comprised of two modes: pre-recorded offline and real-time online.

Online Mode. asmVR used multiplayer networking solution, Netcode⁴, for concurrent engagement with avatars. As both players' movements are tracked, viewers will feel the ASMRtist's touch when their hands touch the viewer's virtual upper body and arms. Similarly, they will feel the intimacy evoked when the ASMRtist whispers in their ear. Through remote ASMRtists, users can engage in real-time ASMR, enhancing intimacy. ASMRtists can assume roles like doctors or massage therapists, using tactile feedback to intensify connection.

Offline Mode. Diverse ASMR experiences such as whispers, interactions with virtual avatars, and hair combing are open for user exploration. By incorporating visual, auditory, genuine tactile, and emotional stimuli, we collaboratively promote the elicitation of ASMR tingling sensations and elevate user immersion.

3 INITIAL STUDY

This study conducted an initial pilot test to explore users' ASMR experiences within the asmVR environment, compared with traditional video mode. Eight participants (4 females, aged 20-30) were recruited. They experienced asmVR (offline mode), video-only ASMR, and a neutral state (control group), then assessed their self-states using questionnaires. Auditory triggers were consistent across video-only ASMR and asmVR, with visual triggers presented in standard video mode. Evaluation encompassed tingling sensations, emotional fluctuations, relaxation states, and asmVR system assessment via questionnaires. The questionnaire design was informed by the experimental methodologies of Poerio et al. [Poerio et al. 2018] and Lohaus et al. [Lohaus et al. 2023].

This study employs one-way ANOVA for the significance analysis of questionnaire results. In the **"body tingling"** level reported by users across three different experiments $p(\text{Control, asmVR}) = 0.0002 < 0.05$, $p(\text{Video-only, asmVR}) = 0.0072 < 0.05$, and for the **"head**

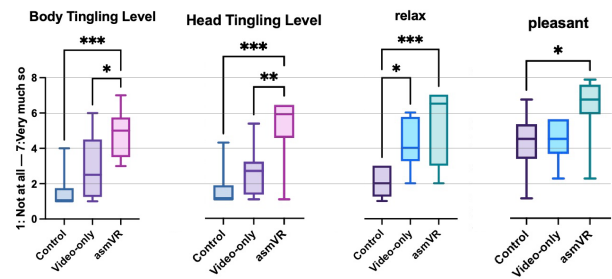


Figure 2: The statistical analysis result of the questionnaire

tingling" level $p(\text{Control, asmVR}) = 0.0004 < 0.05$, and $p(\text{Video-only, asmVR}) = 0.0295 < 0.05$.

In the self-report of user emotions, for reports on the **"relax"** level, $p(\text{Control, Video-only}) = 0.035 < 0.05$, $p(\text{Control, asmVR}) = 0.0009 < 0.05$, and for the **"pleasant"** level $p(\text{Control, asmVR}) = 0.0365 < 0.05$. The result of the pilot test (Figure 2) demonstrates that asmVR enhances participants' tingling sensations compared to video-only ASMR experiences. Additionally, asmVR more effectively promotes relaxation and positive emotional states among participants. These insights underscore asmVR system performance and VR-based ASMR's potential to enhance mental well-being through a distinctly personalized relaxation experience.

4 DISCUSSION AND FUTURE WORK

Through the integration of VR, haptic feedback systems, and interactions with avatars, asmVR enhances ASMR encounters, helping users improve tingling sensation. Also, future works will include diversifying triggers, environments, and exploring VR's application prospects in psychotherapy.

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¹<https://unity.com/>

²<https://www.meta.com/jp/quest/products/quest-2>

³<https://www.bhaptics.com>

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