WEAR A JACKET! Investigating the Effects of Avatars' Appearance on Thermal Perception

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WEAR A JACKET! Investigating the Effects of Avatars' Appearance on Thermal Perception
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Hintergrund

Temperature is primarily detected by central and peripheral sensory receptors sensitive to thermal stimuli [1]. However, thermal perception extends beyond the input from thermoreceptors and is significantly influenced by visual cues [2, 3, 4, 5]. Research on the interaction between visual stimuli and thermal perception, particularly in virtual environments, has shown that VR can simulate and control visual and thermal conditions, offering insights into how visual cues affect thermal comfort. Previous studies have demonstrated that visual cues, such as colored light, and environmental imagery, can affect subjective thermal evaluations [5, 6].

While most research focuses on environmental influences, the potential effects of an avatar’s appearance and its visual features on thermal comfort have received less attention. Avatars, defined as “perceptible digital representations reflecting users' real-time behaviors” [7] create an illusion of embodying artificial bodies, which, if manipulated, can induce psychological and physiological effects, affecting the user in various ways [7, 8]. Kocur et al. (2023) found that extreme avatar designs, like fire or ice hands in corresponding environments, impact perceived temperature [8]. Similarly, Erickson et al. (2019) showed that AR visual effects, such as flames or ice, shape temperature perception depending on whether they are applied to the body or environment [9]. However, these studies focused on extreme scenarios, such as fire or ice hands, typical for sci-fi settings. Thus, the effects of realistic avatars on thermal perception are unclear.

Zielsetzung der Arbeit

This work investigates the impact of realistic avatar features on users' thermal perception. Avatars with varying visual attributes, such as clothing, skin tone, and physique, will be presented in different „levels“ (e.g., „summer“ and „winter“ styles). In an online study, participants will view these images of avatars in a first-person perspective (POV) and provide their subjective thermal perception, with the avatars displayed in various combinations of visual attributes and their levels. The goal is to analyze the subjective and psychological effects of these attributes and understand how avatar representations influence subjective temperature perception. The findings of this study will help optimize avatar and virtual environment design, particularly in relation to temperature perception and user comfort. In the long term, these insights could be applied in the development of immersive VR/AR systems, game design, and other areas of human-computer interaction.

Konkrete Aufgaben

- Researching related work
- Implementing avatars and creating images
- Designing an online study
- Conducting the studies
- Analyzing the data
- Writing the thesis

Erwartete Vorkenntnisse

- Blender, Unity, Daz3d
- Study design
- Data analysis

Weiterführende Quellen

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