**Tabriz Islamic Art University**
**Postgraduate's Thesis Information & Abstract**

**Thesis Title: Analysis of Body Gesture as a Nonverbal Communication in Metaverse**

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Defense Date: 20 Sep 2023
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**Abstract:**

Communication is the utilization of human interaction for the purpose of conveying thoughts, ideas, and emotions. In the surge in COVID-19, computer-mediated communication has experienced a profound upswing. People have turned to digital platforms to maintain their social connections and fulfill their social needs. Despite the privacy concerns associated with video conferences, virtual meetings have not yet been widely adopted.

Virtual interactions often fall short in terms of communication quality, particularly expression of nonverbal cues like body language, postures, and gestures. Moreover, these virtual interactions often necessitate expensive equipment like head-mounted displays and specialized sensors. To address these challenges, our research aims to develop a virtual reality environment that enables the transmission and reception of hand gestures through normal webcams. Furthermore, we explore the impact of hand gestures on communication quality and users' comprehension within the virtual reality setting. After a comprehensive review of previous research methods and findings, we designed and implemented a virtual reality environment capable of hand gesture communication.

Our research involved 23 students from Tabriz Islamic Art University, participating in two distinct experiments conducted within a within-subject design framework. During the experiments, the researcher and participants engaged in interactions with and without hand gestures. At the conclusion of each experiment, we collected data through system logs and questionnaires.

Findings: Our analysis, based on significance levels and research outcomes, demonstrates that within the metaverse environment we designed, users can interpret one another's hand gestures. Moreover, the incorporation of hand gestures enhances the sense of social presence and social richness in these virtual interactions.

**Keywords:** Metaverse, Communication, body language, virtual meetings, Avatar, Computer Vision, body gesture, nonverbal communication, Social VR