Migrant Neighbourhood Preferences Survey Development using Immersive Virtual Reality

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Abstract

Canada's population reached 41 million in early 2024, which can be attributed to the significant influx of migrants in recent years. This resulted in increased infrastructure demands and challenges in social and economic integration. Migrants face barriers such as limited access to affordable housing and inadequate transit. This study explores how virtual reality (VR) can simulate realistic scenarios, which will help determine migrant preferences for certain neighbourhoods, housing, and transportation. For this purpose, it uses VR scenes, created with the Unity game engine and accessed via a head-mounted display (HMD), to immerse participants in different virtual neighbourhood scenes. These scenes include both a dense urban city and a suburban environment. Participants can interact with the neighbourhood scenarios in VR, which are dynamically modified by factors like weather, safety, ethnic components and transportation options. In addition participants will fill out text-based surveys including sociodemographic integration questions and existing neighbourhood and transportation preferences. The results of this research showed participant preferences during the VR experiment were very different from their stated preferences during the text-based surveys. This was the case for both neighbourhood and transportation preferences, demonstrating the influence that experience plays in complex decision making. By using VR to simulate realistic living scenarios, this study provides valuable information on migrant integration. The methodology enables a nuanced understanding of how environmental and socioeconomic factors influence living preferences.

Biography

Thomas Zhao is a first year Masters student in Civil Engineering at Toronto Metropolitan University. He received his first degree in Computer Science from Toronto Metropolitan University in 2024. He has been a researcher at LiTrans focusing on applying immersive technologies for transportation research since 2021, and has published his current research at the ISCTSC conference in March 2025. In addition, he has co-authored 5 journal and conference publications and was awarded the NSERC USRA in 2023.