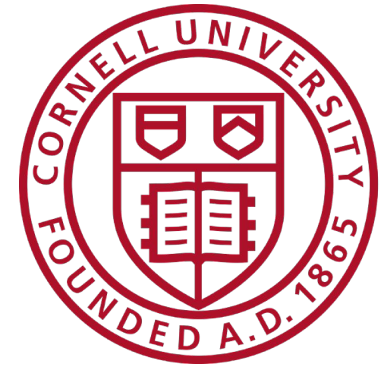


Improving collaboration in remote teams through tools to promote mutual understanding of nonverbal behavior



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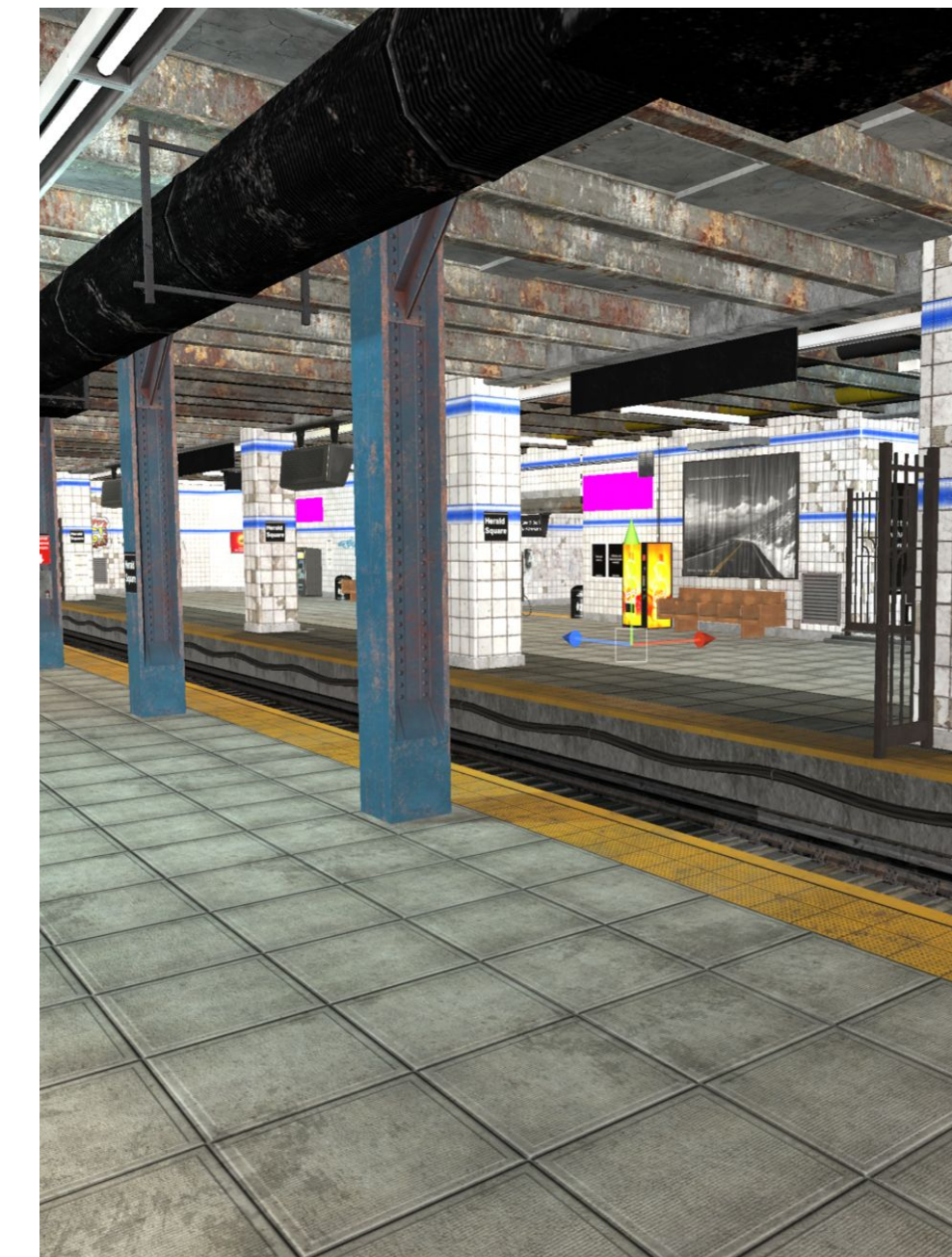


Virtual
Embodiment
Lab

Introduction

Many tools have been developed for remote teamwork, involving traditional email and text chat; video conferencing; and virtual, augmented, and mixed reality. These generally try to recreate the way people behave in face-to-face meetings. Rather than recreate face-to-face interactions, this project works to create environments that improve people's abilities to collaborate remotely, taking into account how non-verbal communication works and the unique qualities of the individuals within a team.

Building from transformed social interaction (Bailenson et al., 2004) we seek to improve interactions both remotely and when teams later meet in person. We target nonverbal communication as a tool to help team members understand how to produce their own, and interpret each other's, behaviors within a particular teamwork context. This research aims to develop guidelines on representing behavior to improve collaboration, and techniques to empower users to transform behavior and appearance while selectively preserving semantic and emotional qualities of gestures.



Environments and avatars Top left to right; waiting room, hospital room, subway station. Bottom left to right, realistic and abstract avatars



Plan of Work

This project is being built in Unity 3D using Unity's first-party version control system, Plastic SCM, for project management. This tool was designed to alleviate the problems git has with larger unity projects. Multiple additional tools will be integrated into the project, such as a multiplayer system. Normcore, a newer networked solution, will be used due to the ease of implementation and wide range of features. Expansions of the project will also include 3D models that will be found online or through the Unity asset store.

The goal is to create a template project focusing on transforming nonverbal behavior and to then package this project to easily extend the work moving forward. This framework will consist of multiple parts, including the ability to replay trials, network connectivity between participants and those running the study, and selective transformation of nonverbal behaviors. While this builds off of the concept of transformed social interaction, framework, a key contribution of this work is that rather than transforming individual behavior to optimize self-presentation, we consider all team members' behaviors to optimize team success.

Research Questions

1. How do individual differences influence people's nonverbal behaviors and their interpretations of others' behaviors in face-to-face and VR settings?
2. What contextual factors shape these behaviors and interpretations, and what is their effect on the quality of the interaction? What is the best way to transform behavior to minimize social discomfort and other negative impacts of difference?
3. How can we modulate people's verbal and nonverbal behavior in VR to provide tools to help team members mutually accommodate each other's behaviors? How can we provide scaffolding to help people recognize each other's preferences and learn to accommodate each other appropriately? We draw on existing VR tools developed in the Won lab and conversational feedback displays developed by Fussell and students.
4. How do people prefer to use such tools to manage their self-presentation, and how do they prefer to receive feedback from their teammates? We will address this issue by iteratively building and testing virtual environments that incorporate each individual's behavior into a shared environment that will be sensitive to context.

Literature Cited

Jeremy N. Bailenson, Andrew C. Beall, Jack Loomis, Jim Blascovich, and Matthew Turk. 2004. Transformed Social Interaction: Decoupling Representation from Behavior and Form in Collaborative Virtual Environments.

Acknowledgements

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