IMMERSCAPE

Interactive Multi-Modal Escape Room
Simulator Combining Audio and Physical Expression

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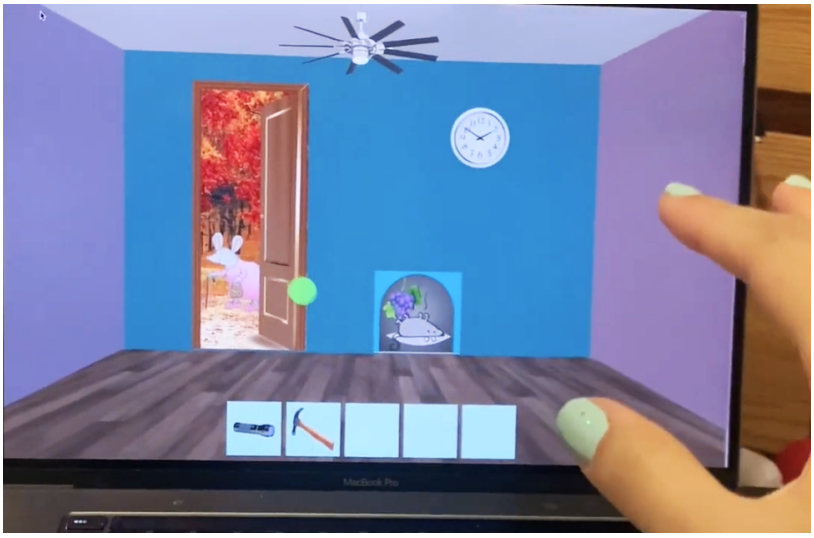

Abstract: We built an interactive virtual escape room by combining LeapMotion's ability to track hand poses and motion, Web Speech API to recognize speech, and graphics rendered by the Famo.us library. The system checks for gestures/speech commands (open, close, turn on, turn off, press, turn right, grab, use an object from inventory, etc.) from the user through the leap and laptop's microphone, processes it in the game logic and gives both visual and audio feedback such as the drawer opening, the light turning on in all of the room, and sound effects and descriptions through Google's Speech-to-Text for the audio feedback such as ("you just obtained the cheese", "can't use hammer on door", etc.). It knows 7 hand gestures and around 16 voice commands, where some actions can be done with either speech or hand gestures depending on the user's personal preference. The system's accuracy rate in hand detection was around 91% on average over all of the hand gestures with 10 trials each. Its accuracy for speech detection was nearly 100% averaged over 8 trials for 4 of the random commands we picked out to test. It worked pretty well for speech detection and certain gestures like turning, grabbing, opening, and zooming in , but struggled with more complicated gestures like pressing a button, partly due to difficulty in classifying a motion as one of the moves and also the finnickiness of the LeapMotion detector.