Using Hand Tracking and Server Architecture to Allow Online Control of a Robotic Hand

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Access to remote technology has become increasingly important due to the growing need for innovative telecommunication between human to machine operations in everyday life. However, there is a lack of convenient and interactive physical remote connections and communication between individuals. The project is an affordable interactive robotic representation of an individual via a robotic arm prototype that would allow someone to be somewhere physically without actually being there. The uniqueness of the project stems from being the first consumer networking robotic hand prototype that physically represents an individual in telecommunication. The robotic hand has a networking architecture allowing for direct communication from the user to the hand they are controlling. These coordinates correlate to each joint of the hand and these vertices are sent to a connected server that streams its data in real-time. The solution has four main parts being the Master Server, Fleet Server, Robotic Client, and User Client. The Master Server authorizes and redirects users to appropriate Fleet Servers. The Fleet Server handles the strain of calculating and sending these responses to its respective Arm Client. The User Client will be an application that will talk to the network architecture. The Arm Client consists of two parts being the Boards and software that control the robotic hand. The prototype was a cardboard robotic arm to test the ability of the networking system. The model was functional in imitating the controller's hand. The prototype system was successful in allowing people to physically represent themselves in a place they cannot be. The limitation of the project is the Arm Client lacks an efficient way of assigning unique ids for each robotic arm.

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