



Figure 8: Gestures should be favored over words

volve two human beings; one of them assuming the role of a robot. One of the systems takes place in a lab setting and is designed to gather more noisy and realistic initial data. In it, the person assuming the role of the robot is instrumented. The other system is set in a virtual environment and is designed to gather data with which to train the second stage of our system. In the second stage, the robot will be simulated through software rather than a person. The second stage is designed to gather more realistic data. Only in the final stage will we use and train a physical robot. We described a test suite that is designed to test and train our system and in a sense defines complexity for human-robot interaction. We presented performance metrics as well as an evaluation of our initial data set. From the evaluation, we learned that our data gathering instruments are sound: there does not appear to be any correlation between the task completion metric and the communication performance metric. We observed that there is an inverse relationship between the number of words used versus the number of gestures used. Based on our evaluation metric, better performance can be achieved by using more gestures than words.

The immediate future is about generating yet more data through our human-as-robot systems. We aim to gather data from 1,000 games, primarily from the virtual system. This will enable us to proceed to the second stage in which a software bot will assume the role of the robot. For this stage, we will set-up and train the bot with the data gathered during the first stage. The bot will be deployed in the 2D simulation software. In order to be prepared for the third stage of the project, one in which a physical robot will be used, we will additionally develop and train a 3D software simulation of our system. This latter simulation will conduct automated performance measure computations.

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