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Assignment# 2
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Title: Gestural Communication in Collaborative Physical Tasks

Objectives of the Project:

The project conducted by the Human-Computer Interaction Institute at Carnegie Mellon University aims to address the growing need for effective collaboration on physical tasks among individuals distributed across space and time. Traditional collaboration tools have focused on tasks performed without reference to the external spatial environment, leaving collaborative physical tasks relatively underserved. The project seeks to develop technologies that enable remote partners to communicate and interact as seamlessly as they would in face-to-face settings while engaged in physical tasks. The research focuses on the use of speech and various types of gestures, such as pointing and representational gestures, to facilitate communication during these collaborative physical tasks.

Summary of Different Features of the Project:

1. Understanding Gestures in Face-to-Face Settings:
The project seeks to increase understanding about the types of gestures used when individuals engage in conversations about physical objects in face-to-face settings. Observational studies are conducted to examine how people's speech and gestures are intricately related to the position and dynamics of objects, people, and ongoing activities in the environment. The impact of these gestures on communication and task performance is also explored to inform the design of effective gesture-based communication systems.

2. Evaluating Alternative Gesture Implementation Methods:
The research aims to systematically evaluate various methods for implementing gestures in systems designed to support remote collaboration on physical tasks. The focus is on both pointing and representational gestures. Pointing gestures require a view of the target object, while representational gestures require a view of the speaker's hands. The project aims to find solutions that enable remote users to perform these gestures effortlessly, overcoming the challenges posed by different visual requirements.

3. Developing a Prototype System for Remote Communication:
Based on the insights gained from the research, the project endeavors to develop and test a prototype system that allows remote communicators to produce and interpret both pointing and representational gestures as naturally as they would in face-to-face interactions. This system aims to enhance the efficiency and effectiveness of collaboration in domains such as medicine, education, vehicular repair, and other physical tasks.

The project encompasses a series of laboratory experiments, field studies, and technology development efforts, all closely inter-related. By leveraging these research activities, the project seeks to make significant contributions to the design and improvement of remote collaboration systems for various physical tasks. Ultimately, the project aims to facilitate seamless communication and collaboration among individuals separated by distance, while engaged in complex and critical physical activities.