

Assessing videos about human-human interaction during the physical therapy to retarget robot-human therapy

Christian Tamantini (BA, MA in Biomedical Engineering)

Daniele Caligiore (Researcher ISTC-CNR)

Loredana Zollo (Researcher Università Campus Bio Medico)

Topics

- Video Analysis
- Robot-aided rehabilitation

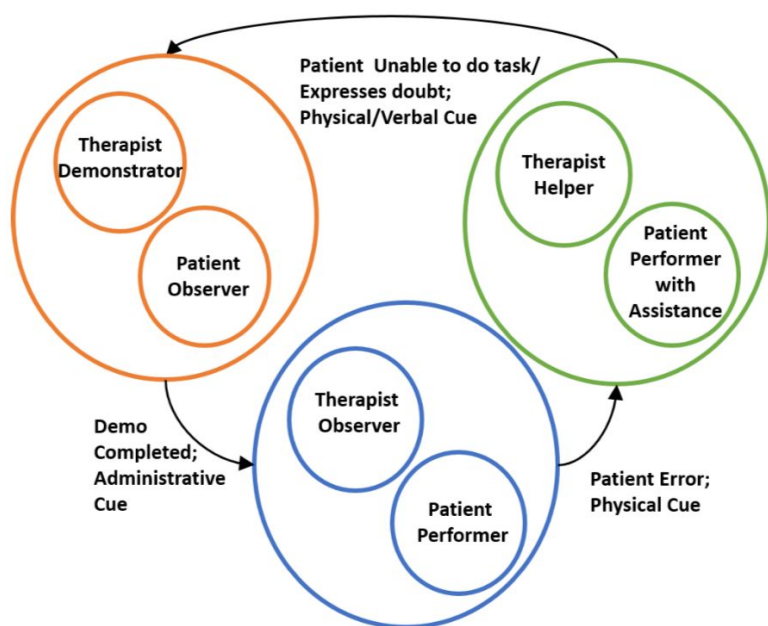


Fig. 2 Model of the therapy proposed by Johnson

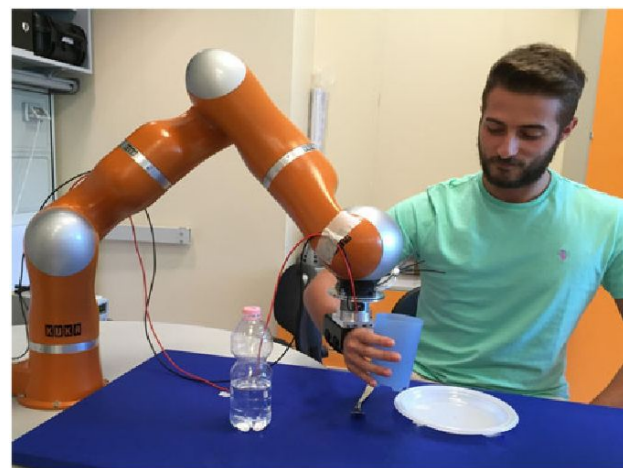


Fig. 1 Robot-aided rehabilitation

Problem

Current robot-patient interactions do not accurately model therapist-patient interactions in task-oriented stroke therapy. We need to analyze the human-human interaction during a common rehabilitation session. So that a controller for a robot could be properly designed: the robot mimics the therapist behaviour according to the stimuli perceived from the patient.

Objective

- Assess the human-human interaction during the therapy:
 - Applying the open-pose algorithm (Fig. 3);
 - Modeling the interaction according to the scheme in Fig. 2;
 - Obtaining and analyzing the kinematic and interaction forces involved in the therapy in a highly structured environment (i.e. using optoelectronic systems and FSR sensors);
- Retarget the therapist behaviour into a robotic platform:
 - Developing a Neural Network controller for an anthropomorphic robot.

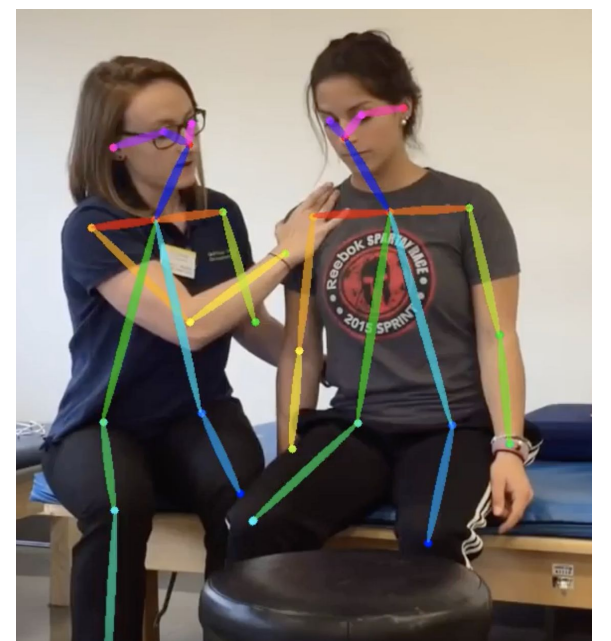


Fig. 3 Skeleton tracking made with open-pose algorithm