

Emotion in Motion

In the near future, robots are expected to perform tasks at many levels in our society. In this context, it is very important to exploit the possibility of using body language as a communication channel to enhance the human-robot interaction. The goal of this project is to provide the robot with the ability of executing emotion-expressing whole-body motions, to make the robots capable of encoding emotions such as happiness, sadness, anger etc. in their movements to properly react on perceived human emotions.

Unlike for facial expressions, little attention has been paid with regard to whole-body motion databases for emotion-expressing body language. The student will explore possible parameters to encode emotions in a motion, based on some previous works that use velocities of the joints, amplitude of motion and time scaling. In the next stage, the student will be asked to implement methods and interfaces to allow exchange of emotion-expressing motions to a robot. The student will be provided access to our group KIT whole-body motion database that contains many whole-body motions and to the Master Motor Map (MMM) framework that provides methods and tools which facilitate the retrieval and the processing of motion in order to form training data for the recognition, learning, and reproduction of motion on robot systems (Terlemez et al. 2014).

This is a very novel topic with important applications in the field of human-robot interactions and humanoid robots. Therefore, the student work in this context can lead to important contributions to the robotics research community.



Figure 1: Examples of motion action from the KIT Motion Database with different execution parameters.

O. Terlemez, S. Ulbrich, C. Mandery, M. Do, N. Vahrenkamp and T. Asfour, (2014) Master Motor Map (MMM) - Framework and Toolkit for Capturing, Representing, and Reproducing Human Motion on Humanoid Robots, IEEE/RAS International Conference on Humanoid Robots (Humanoids), 2014

Contact: Julia Borrass Sol (julia.borrassol@kit.edu) and Tamim Asfour (tamim.asfour@kit.edu)