Lecture 4: Social aspects in HRI
Human Robot Interaction

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1 Body movements

- Current robots are limited in their detection of facial expressions
  - Age affects this
- Determine how body movements depicts emotions.

Cultures can affect how people show emotions, and if they show emotions.

2 The function of culture

Defines how we interpret situations, attitude, goals, etc. It also provides behavior patterns. There are many ways of interpreting the word "culture"

- Categorial (hall's) (widely used)
- Dimensional
- Brown/levinson

2.1 Hall's Framework

- Space (Last lecture)
- Context
- Time

Context is how the communication is explicitness or maybe you infer sarcasm.
Monochronic time is cultures who follow time explicitly. Polychronic time does not necessarily use the clock, perhaps you start a meeting before everybody has shown up. They do not take clock time too seriosly.

3 Systems of values: Hofstede

This accounts for different peoples work cultures. They are distributed across 6 dimensions.

- Power Distance Index (how much power is decregated)
- Individualism / collectivism (How individual do people be)
- Masculinity / feminity (Distribution)
- Uncertainty Avoidance Index
- Long Term Orientation
- Indulgence-restraint

It is howerver descritptive, meaning that we still need data to describe reality a bit more.

4 Cultural Differences in communication Style

- Implicit (implicit communication → Not so direct)

- Explicit (explicit communication → Direct)

5 Creating affective body movements across cultures

Use Laban movement parameters to make the Nao robot epxress emotions.

6 Use decision trees

To determine knocks on doors, you could infer different emotions of the different parameters. The most important paramter was the weight of the knock.

7 Role of Trust in automation

How can we change the trustworthyness calibration of trust in automation.

7.1 Measuring trust

This is usually done wit 40 questions questionairs. Good for ground truth, but it does not account for dynamically changing trust.

7.1.1 What do we need to do?

- Identify risk factors (What risks do exist)

- Manipulate the trust in princpled way. How can we bring people to low or high trust levels?

- Maping sensor data to trust score

- Assessment the trust levels

- Trust calibration

Looked at two different risk factors, and how does it affect the trust? Is the robot in front or behind you. The riskier the task → the less trust.
Collaborative robot (you hold the paper, and the robot draws on the paper) If we change the speed, the no matter the direction, the trust levels dip. Higher speed is lower trust, and lower trust development.

7.2 Estimating trust

You can use an IMU suit which can give specific movement outputs, which by running it through FCNN's gives a trust score, which can be plotted in the calibration square.