Cooperation via Manual Communication

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Dissertation proposal summary

The aim of the project is to contribute to the area of heterogeneous robot interaction using alternative communication medium, namely, gestures/patterns/signs/etc., projected by robots in a way that their body structures allow them.

Each robot will be given a new cognitive model that will support such communication. This model will have to be given a set of basic rules, so called ‘innate knowledge’ of a robot, that will govern robot’s initial behavior in an environment. This basic set of rules will support the development, as a result of interaction with environment, of a more complex cognitive model on the top of the existing one. Robot will be able to sense the environment in a way available to it and be able to communicate its own perception of the environment around it using available body parts. Robot, to which this information is communicated to, will be able to interpret that information using it’s own perception of the environment it currently inhabits. After the interpretation process, the robot will be able to ‘understand’ communicated information.

The outcome of the project is to research whether such communication is feasible using heterogeneous robots. If communication is feasible, test if short-term robot-robot interaction can be enabled. If so, then the next step is to find out whether two different perception models of two different robots can reach a consensus regarding the information that is was transferred. As an additional step, (developed) cognitive models can be tampered with to see how corrupted models affect communication between robots.

For the future work, robots can be placed with the humans in the same environment to see whether long-term human-robot interaction using gestures can be achieved. For expansion, gesture cooperation can be scaled up to audio-analysis/synthesis interaction, where it can be tested whether similar model can be scaled to enable language development in robots.