REACTIVE AND ADAPTIVE CONTROL LOOPS FOR SOCIAL LEARNING IN HUMAN ROBOT INTERACTION

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NEURAL BASIS

The cerebellum has been long studied in the context of classical conditioning. It acts as an adaptive controller that learns to anticipate aversive stimuli using contextual sensory information, which otherwise would trigger a purely reactive action.

CONCLUSIONS AND FUTURE WORK

Results show a consistent decrease of human feedback. The model also displays interesting generalization properties, where the adaptive behavior learned adapts to online and offline changes in shape and position of the painted figure.

The general purpose of the algorithm allows its application to any situation where feedback can be anticipated through contextual information.

Current work is directed to adding the roles of the cortex and amygdala, which would allow the automatic extraction of the relevant features for the task (currently given by default).

EXPERIMENTAL SETUP

We used an iCub robot painting in a Reactable. A figure was drawn on the interactive table. The robot could paint anywhere without restriction. Human feedback would restrain it from crossing the borders. We compared the performance of the reactive and the adaptive controllers.

REFERENCES


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