Developmental Learning for Social Robots in Real-World Interactions

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- Joint lab between Hoomano and LIRIS.
- Founded by the French Research Agency (ANR).
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Research objective

- **Make HRI more natural, more intuitive using developmental learning.**
- **High adaptation to dynamic environments that include humans.**

Problem statement

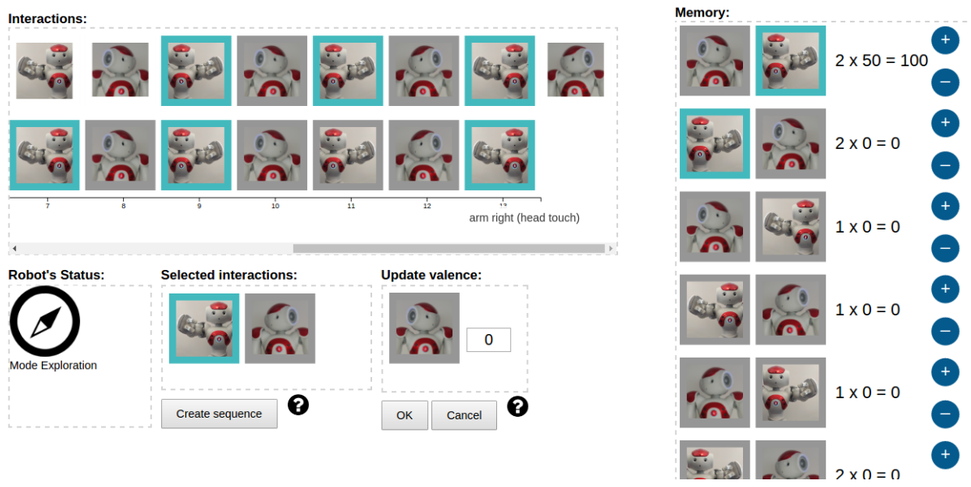
- Scripted behaviors.
- Lack of social intelligence.
- Not suited to the dynamic context of HRI.

Methodology: developmental learning

- An approach inspired by theories on the cognitive development of human being.
- An online, unsupervised learning algorithm based on few or no prior knowledge on the environment.
- The agent interacts with its environment to build its own representation of the world.

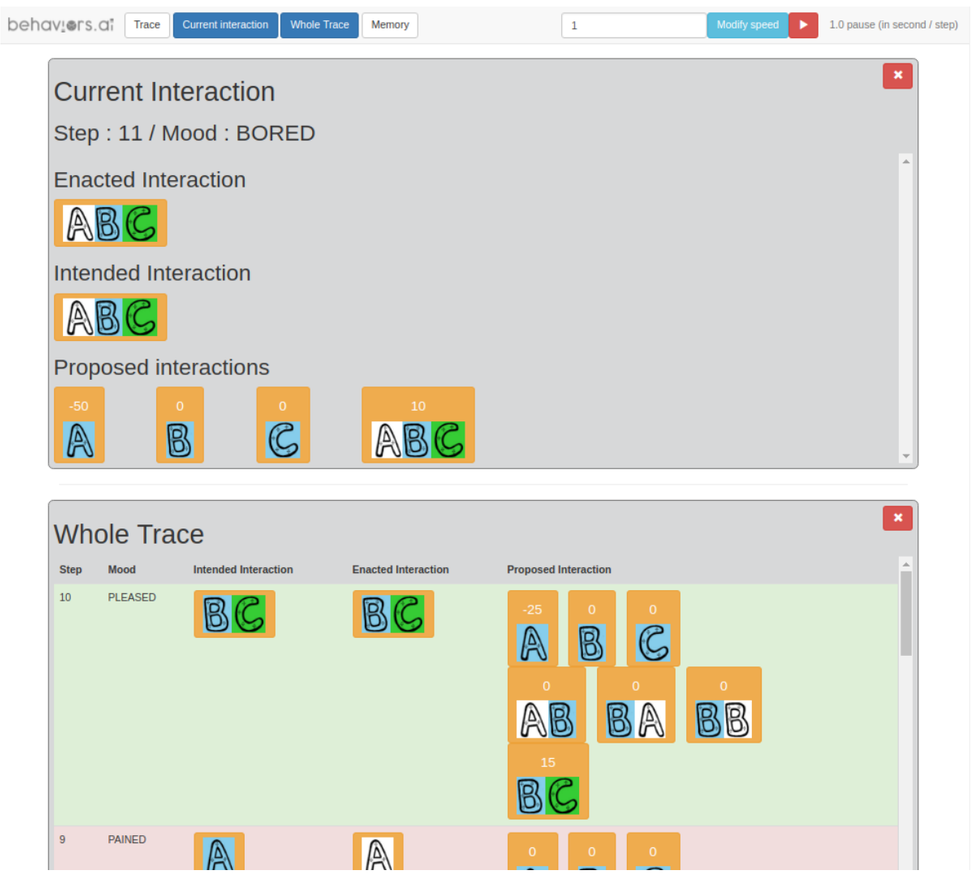
Implementation

- Construction of sequences of interactions represented as a 2-tuples (experiment, result).
- Robot implementation of a previous algorithm performing well in simulation.
- The algorithm enables NAO to learn sequences of two interactions according to the user's preferences.
- Two major obstacles encountered: speed and reliability.



Interface

- Visualizing the algorithm's execution trace and modifying it on the fly.
- Setting up some of the algorithm's parameters.
- Controlling the algorithm's execution.
- Enabling to produce configurations ready to be tested in real-world experiments.



Perspectives

- Improving the algorithm to get more complex behaviors.
- Using high level actions and perceptions for scalability.
- Evaluating the impact on the user's experience.