# Establishing Sustained, Supportive Human-Robot Relationships: Building Blocks and Open Challenges

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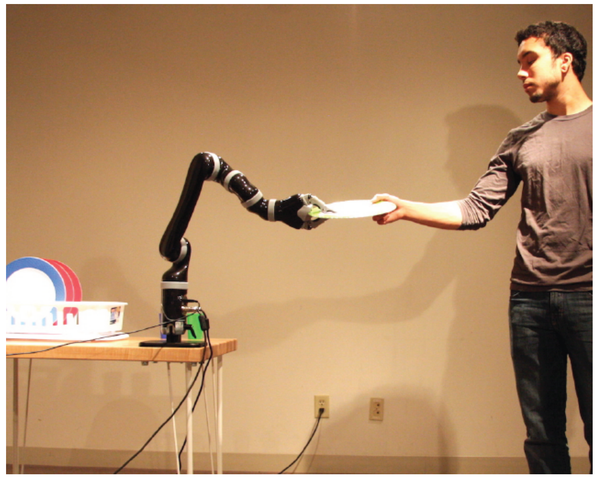
As social robots become common alongside humans to support a variety of tasks in daily interactions, their establishment of sustained, supportive relationships with humans is essential to their success in reaching intended outcomes. We discuss three building blocks - **socially intuitive interaction**, **personalized interaction experience**, and **long-term interaction** - that facilitate the formation of such human-robot relationships, as well as related open challenges.

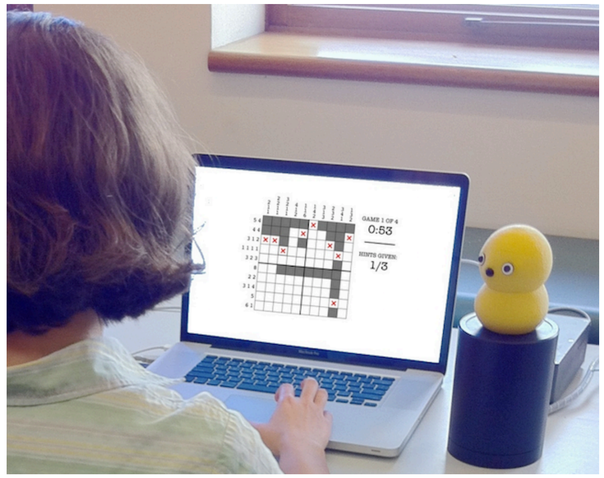
## Socially Intuitive Interaction



**Expression** – communicating internal states to humans (gaze, deixis)

**Interpretation** – understanding human partners' internal states (attention, intention, and affect recognition)

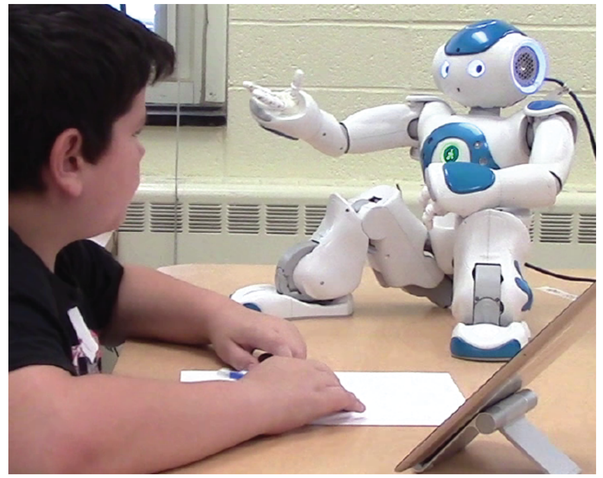
## Personalized Interaction Experience



**Perception** of individual needs, preferences, and states of human partners

**Personalization** of robot behavior to the perceived differences

## Long-Term Interaction



**Explore** the long-term effects of repeated human-robot interactions (learning gains, behavior change)

**Discover** how humans adapt to and interact after repeated interactions with a robot

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