Face-to face conversation with socially intelligent robots

Mary Ellen Foster
School of Computing Science
University of Glasgow
Glasgow G12 8RZ, United Kingdom
MaryEllen.Foster@glasgow.ac.uk

Face-to-face conversation is both the fundamental form of human interaction and the richest possible means of communication. It supports three dimensions that other forms of interaction do not: unrestricted **verbal** expression; full access to all **non-verbal** channels; and instantaneous **collaboration** among the participants (Bavelas et al., 1997). For an artificial communicator such as a robot, the richest and most natural form of interaction is therefore one that mimics face-to-face conversation as closely as possible on all of the above dimensions.

In popular culture and science fiction, the prototypical image of a "robot" is precisely this: an artificial human that is able to engage fully in all aspects of face-to-face conversation. In practice, this sort of *socially intelligent* robot (Dautenhahn, 2007) can be used in any context where the robot must engage in real-world interaction with one or more human partners, where the humans might not necessarily have any special training before encountering the robot.

Developing a robot that is able to participate fully in this sort of natural, face-to-face conversation in the real world presents significant technical challenges: the robot must be able not only to understand the multimodal communicative signals of its human partners, but also to produce understandable, appropriate, and natural social signals in response.

In this talk, I will present three recent projects which aim to develop robots that support this sort of socially intelligent conversation with human partners: the JAMES socially aware robot bartender (http://james-project.eu/), the MuMMER socially intelligent shopping mall robot (http://mummer-project.eu/), and the SoCoRo training robot for adults with autism (http://www.socoro.net/).

References

Janet Beavin Bavelas, Sarah Hutchinson, Christine Kenwood, and Deborah Hunt Matheson. 1997. Using face-to-face dialogue as a standard for other communication systems. *Canadian Journal of Communication*, 22(1).

Kerstin Dautenhahn. 2007. Socially intelligent robots: dimensions of human-robot interaction. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 362(1480):679–704.