Understanding Human-Robot Team Cognition

The Cognitive Sciences Lab (CSL) research on team cognition encompasses interdisciplinary thinking on teamwork by considering issues surrounding the design and development of human-agent teams, that is, teams composed of humans interacting with autonomous or semi-autonomous intelligent agents or robots. Our early work in this area led to current research to study theory of mind and embodied cognition in the context of human-robot teams (Bockelman Morrow & Fiore, 2012; Elias, Bockelman Morrow, Streater, Gallagher, & Fiore, 2011; Fiore, Elias, Gallagher, & Jentsch, 2008; Streater, Elias, Bockelman Morrow, & Fiore, 2011). Current research at the CSL addresses the complexities inherent in human-robot teaming and how to understand what we call artificial ‘social’ intelligence. Here we study theorizing on dual-processing accounts of social perception in human-robot teams (Wiltshire, Barber, & Fiore, 2013; Wiltshire, Lobato, Jentsch, & Fiore, 2014; Wiltshire, Warta, Barber, & Fiore, 2017). From the computational standpoint, this work involves developing and testing an algorithmic model of what is called social calculus for human-agent interaction and intention understanding (Khan, Streater, Bhatia, Fiore, & Bölöni, 2013) as well as how machine learning can be used to improve learning social cues for artificial social intelligence in machines (Best, Kapalo et al., 2016; Best, Warta et al. 2016).

We have been empirically examining this line of social cues and social signals in human robot their prototype Ava™ platform, we studied how altered attributions of intention and emotion in a Lobato, Jentsch, Huang, & Axelrod, 2013; Warta contributed to a fundamental understanding of particular, we have neuroscience, radical embodied cognitive theorizing to study the relationship between interaction. In collaboration with iRobot, and manipulations of proxemics and gaze cues hallway navigation scenario (Fiore, Wiltshire, et al., 2018). From this we have also "theory of mind" and social cognition. In worked to integrate theories from psychology, and philosophy to reconcile cognition with traditional approaches to neuroscience (Wiltshire, Lobato, McConnell, & Fiore, 2015). We’ve extended this to show how it can help us understand social robotics through research and application in human robot interaction (Lobato, Warta, Wiltshire, & Fiore, 2015; Lobato, Wiltshire, Hudak, & Fiore, 2014; Warta et al., 2016; Wiltshire et al., 2015; Wiltshire, Snow, Lobato, & Fiore, 2014; Wiltshire, Lobato, Velez, Jentsch, & Fiore, 2014). As such, this represents an important developing body of work that is breaking ground by integrating new theory in social cognitive processes with robotics and human robot interactions.
REFERENCES - Understanding Human-Robot Team Cognition

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