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Authors

Stacy, Stephanie
Zhao, Qingyi
Zhao, Minglu
et al.

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Intuitive Signaling Through an "Imagined We"

Stephanie Stacy

University of California - Los Angeles, Los Angeles, California, United States

Qingyi Zhao

University of California - Los Angeles, Los Angeles, California, United States

Minglu Zhao

University of California - Los Angeles, Los Angeles, California, United States

Max Kleiman-Weiner

Massachusetts Institute of Technology, Cambridge, Massachusetts, United States

Tao Gao

UCLA, LA, California, United States

Abstract

Communication is highly overloaded. Despite this, even young children are good at leveraging context to understand ambiguous signals. We propose a computational shared agency account of signaling that we call the Imagined We (IW) framework. We leverage Bayesian Theory of Mind to provide mechanisms for rational action planning and inverse action interpretation. In order to expand this framework for communication, we first treat signals as rational actions. We then incorporate our rich understanding of intuitive utilities to constrain the scope of affordable actions. Finally, we treat communication as a cooperative act, subject to constraints of maximizing a shared utility. We implement this model in two completely different behavioral psychology works to demonstrate the generality of the IW under different types of uncertainty in cooperative communication. Additionally, we demonstrate that the IW outperforms multiple baseline models in a novel task across a series of simulation conditions.