Bridging the communicative gap between robots and humans, by analogy

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Abstract: The ability to create and understand novel communicative signals is exemplary of people's creative and inferential abilities. For example, when traveling and unable to speak the local language, we can make ourselves understood by creating novel gestures. This ability is a form of abductive inference, and requires people to generate novel hypotheses about possible meanings of signals (abduction proper). We propose that novel hypotheses may be generated from scratch by re-conceptualizing perceptual and conceptual representations through analogical augmentation.

We plan to use robotics methodology to assess the plausibility of this model. By enhancing a robot with analogical augmentation we aim to enable it to generate novel gestures based on analogies. This lays the groundwork for more natural human-robot interaction. Furthermore, by studying the robot's gestures and to what extent people can understand them, we gain better understanding of the abduction-based computational processes underlying communication.