Generalizing Context for Effective Grounding of Ambiguous Language

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1 Problem Definition

Context is critical to understanding human communication. It is used by humans to encode knowledge assumed to be shared, disambiguate between otherwise equivalent options, and simply convey things more efficiently than might otherwise be possible. Thus, in order for robotic teams to be able to coexist with humans and collaborate on complex tasks, we must have a general means of understanding contextual information and including it in the language grounding process.

As detailed in the related work, the problem of context inclusion has previously been studied with limited success. Most approaches are only capable of incorporating very limited forms of context (i.e. basic knowledge about the environment configuration), require retraining of the model for changes in context, and/or insufficiently capture the temporally varying nature of context.

We think that we can succeed in this area where others have failed due to two factors: First, insights into the nature of context specifically in terms of its use for grounding. Second, the advent of deep learning approaches (specifically such things as sequence prediction and attention mechanisms) may prove useful for selecting salient context.