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Applying Computational Models of Spatial Prepositions to Visually Situated Dialog

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Abstract

This article describes the application of computational models of spatial prepositions to visually situated dialog systems. In these dialogs, spatial prepositions are important because people often use them to refer to entities in the visual context of a dialog. We first describe a generic architecture for a visually situated dialog

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system and highlight the interactions between the spatial cognition module, which provides the interface to the models of prepositional semantics, and the other components in the architecture. Following this, we present two new computational models of topological and projective spatial prepositions. The main novelty within these models is the fact that they account for the contextual effect which other distractor objects in a visual scene can have on the region described by a given preposition. We next present psycholinguistic tests evaluating our approach to distractor interference on prepositional semantics, and illustrate how these models are used for both interpretation and generation of prepositional expressions.

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