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# Inferring Knowledge from Behavior in Search-and-rescue Tasks

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## Abstract

Theory-of-Mind inference is natural for humans but poses significant computational challenges. The core difficulty can be traced back to the exponential growth of paths to consider in planning given a mental state. In this paper we tackle this problem in a search-and-rescue task implemented in Minecraft. Our goal is to infer differences in knowledge from participants' continuous-time trajectory. By abstracting the spatio-temporal state space and the reward function together, we surface natural decision points, on which we compare the participants' behavior to myopic rational agents of varying knowledgeability. Collectively, the abstraction and rational agent analysis yield successful inference of participants' knowledge states and reveal distinct patterns of their exploratory behavior.