

Scientific abstract and the application's title

Agent-Centered Plan and Goal Recognition

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Scientific Abstract

Plan, activity, and intent recognition (PAIR for short; inclusive of variants) is an active area of research in artificial intelligence. Broadly and briefly, PAIR is the problem of recognizing the unobserved hidden plans, goals, state, intentions or intentionality—given observations of an agent and/or its interactions with its environment. It is an abductive inference process, from observed effects to possible causes. The capability for PAIR is a key component in many AI subfields and applications: User modeling, multi-agent systems, intelligent tutoring systems, machine vision for surveillance, cyber-security, human-robot and human-agent interactions, virtual environments, and more.

In recent years, a new approach to PAIR has been proposed and pursued: Plan and Goal Recognition as Planning, by which a planner is used to generate candidate explanations (recognition hypotheses) for the observations of the agent. This approach leaves behind decades-old reliance on a dedicated recognition library, but reinforces an assumption that the potential goals of the observed agent are known to the observer. This assumption raises significant open challenges to recognition-by-planning: (1) the ability to recognize combinations of known goals (e.g., recognition of a plan that interleaves actions so as to pursue two goals), and (2) the ability to recognize novel goals—goals that are known and are pursued by the observed agent, but are unknown to the observer.

This proposal tackles these challenges. The proposed research will result in a framework for recognition by planning, where the recognition process allows for unfamiliar goals to be recognized, as a stepping stone to learning from observation and imitation.