Partial-Order Ambiguous Observations of Fluents and Actions for Goal Recognition as Planning

Jennifer Nelson
University of Utah

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Abstract

This work readies goal recognition for real-world scenarios by adapting a foundational compilation by Ramírez and Geffner to work with partial-order, ambiguous observations of both facts and actions. We first redefine what observations can be and what it means to satisfy them. We provide a compilation from goal recognition problem to classical planning problem, then prove it accommodates these more complex observation types. Our compilation can be adapted towards other planning-based plan/goal recognition techniques, as Ramírez and Geffner's compilation was.

We prove that our method is at least as accurate as an "ignore complexity" strategy that uses Ramírez and Geffner's compilation. Experimental results confirm that, while slower, our method never has more (and often has fewer) false positives. (Both methods have no false negatives.) We discuss these findings in the context of goal recognition problem difficulty, and present an avenue for future work.