

Safety Verification of Decision-Tree Policies in Continuous Time

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Abstract

Decision trees have gained popularity as interpretable surrogate models for learning-based control policies. However, providing safety guarantees for systems controlled by decision trees is an open challenge. We present the first dedicated algorithm to verify decision-tree controlled systems in continuous time. The key aspect of our method is exploiting the decision-tree structure to propagate a set-based approximation through the decision nodes.

Keywords

Decision tree, Control, Reachability analysis, Safety verification