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## Speeding up Online POMDP Planning - unification of observation branches by belief-state compression via expected feature values

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### **Abstract**

A novel algorithm to speed up online planning in partially observable Markov decision processes (POMDPs) is introduced. I propose a method for compressing nodes in belief-decision-trees while planning occurs. Whereas belief-decision-trees branch on actions and observations, with my method, they branch only on actions. This is achieved by unifying the branches required due to the nondeterminism of observations. The method is based on the expected values of domain features. The new algorithm is experimentally compared to three other online POMDP algorithms, outperforming them on the given test domain.