Safety Aware Reinforcement Learning by Identifying Comprehensible Constraints in Expert Demonstrations

Leopold Müller, Lars Böcking, Michael Färber
Deriving Safety Rules from Expert Demonstrations

Trajectory = \{s_0, a_0, s_1, a_1, \ldots, s_T\}

Consider Paths as Association Rules and use Metrics as Hyperparameters

\[ \text{Support}(s \Rightarrow a) = \frac{f(s \Rightarrow a)}{|s|} \]
\[ \text{Confidence}(s \Rightarrow a) = \frac{f(s \Rightarrow a)}{f(s)} \]

IF \( x_0 \leq -0.042 \) & \( x_5 \leq 0.032 \) THEN \( a = 1 \)

Decision Tree CART-Algorithmus

Convert filtered Path into Set of Safety Rules
Influence of the hyperparameters on the rule set

Influence of the minimum values of support and confidence on:

(a) number of safety rules

(b) average length of safety rules
Evaluation of Safety Layer

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