# Article information:

Model-free reinforcement learning from expert demonstrations: a survey | SpringerLink  
<https://link.springer.com/article/10.1007/s10462-021-10085-1>

# Article summary:

1. Model-free reinforcement learning from expert demonstrations (RLED) uses prior or online knowledge from demonstrations to guide the RL process.

2. RLED is formalized in the context of a Markov decision process (MDP), where the objective is to find a control policy that maximizes the discounted cumulative reward.

3. Expert demonstrator policies are used to provide knowledge from demonstrations, which may not necessarily follow an optimal control policy due to natural human reasons.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

该文章是一篇关于无模型强化学习（Model-free reinforcement learning）的综述，介绍了从专家演示中获取知识来指导RL过程的方法。然而，该文章存在以下几个问题：

1. 偏重于技术细节而忽略了实际应用

该文章主要关注技术细节和理论框架，但却缺乏对实际应用的深入探讨。例如，在实际应用中，如何选择合适的演示者、如何处理演示者提供的不完美数据等问题都没有得到充分讨论。

2. 忽略了人类因素

该文章认为演示者是专家，并假设其提供的演示轨迹是正确且可靠的。然而，在现实情况下，人类演示者可能会出现错误或失误，这些因素可能会影响到学习效果。

3. 缺乏对风险和不确定性的考虑

该文章没有充分考虑到在使用无模型强化学习时可能面临的风险和不确定性。例如，在某些情况下，由于环境变化或其他因素，学习算法可能会产生意外结果或失败。

4. 缺少对其他方法的比较

该文章只介绍了一种方法来获取专家演示的知识，但没有对其他方法进行比较。例如，基于模型的强化学习和基于演示的强化学习等方法也可以用来获取专家知识。

综上所述，该文章存在一些偏见和局限性，并需要更全面地考虑实际应用和风险因素。同时，需要与其他方法进行比较以确定最佳解决方案。

# Topics for further research:

* Practical applications of model-free reinforcement learning
* Human factors in expert demonstrations for reinforcement learning
* Risk and uncertainty in model-free reinforcement learning
* Comparison of different methods for acquiring expert knowledge in reinforcement learning
* Limitations and biases in the discussed approach
* Need for a comprehensive consideration of practical applications and risk factors in reinforcement learning.

# Report location:

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