Paper name: Sim-to-Real Transfer in Deep Reinforcement Learning for Robotics: a Survey
link : https://arxiv.org/pdf/2009.13303.pdf

1. Summary:

This research examines robotics deep reinforcement learning knowledge transfer from simulation to reality. Schooling concepts are detailed in the background study. Deep reinforcement learning, knowledge distillation, transfer learning, and domain adaptability are included. The study found system identification essential for reliable mathematical models. Domain randomization, adaptability, imitation learning, meta-learning, and knowledge distillation close simulation-real-world performance gaps. Recent breakthroughs are classified, their applications are examined, and the potential and challenges of applying simulations to real-world situations are discussed. This subject must improve simulation design efficiency. Furthermore, deep domain adaptation methods must overcome their limitations. Changing regulations to accommodate different roles is difficult. Finally, this topic's weak research needs immediate attention and remedies. Conclusion highlights sim-to-real transfer's difficulty and need for more investigation. Researchers should employ theoretical and empirical methods to improve robotics deep reinforcement learning.

1.1 Motivation:

The researchers want to study methods, identify common approaches, investigate alternative research pathways, categorise recent works, evaluate practical implementation scenarios, and discuss this domain's prospects and limitations. Final examination analyses current and future deep reinforcement learning for robotics sim-to-real transfer. The paper discusses current challenges and research prospects to comprehend the field's future.

1.2 Contribution:

The Deep Reinforcement Learning for Robotics Sim-to-Real Transfer survey improves research. This platform classifies new studies and evaluates outstanding difficulties. The survey proposes future research directions to advance the field. The user suggests a thorough evaluation and situational analysis of sim-to-real transfer procedures. This evaluation highlights this field's future.

13.Methodology:

Researchers examined end-to-end and sim-to-real deep reinforcement learning (DRL) policy transfer in robots and sensing. Methodical and thorough robot deep reinforcement learning sim-to-real transfer survey. Ending with a thorough examination of exciting findings and open topics. This method ensures comprehension.

1.4 Conclusion:

Researchers and practitioners can use the Sim-to-Real Transfer in Deep Reinforcement Learning for Robotics survey. It examines current research, categorises recent findings, and addresses future research and challenges. In robotics deep reinforcement learning, sim-to-real transfer is better understood.

2. Limitations:

2.1 First limitation

Possible partiality in the literature review

2.2 Second Limitation:

The concentration on contemporary works might overshadow the significance of previous fundamental research.

3 Synthesis:

The current review paper provides a thorough review of sim-to-real transfer in deep reinforcement learning for robotics. It categorises recent studies and discusses on unresolved problems, which makes it a valuable reference for individuals working on research and practical applications inside this field of study.