ETHz Robotics Seminar

keywords: sensor, reinforcement learning, sim2real

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Concept:

- **simulation bias** : The resulting policies may work well with the forward model (i.e. the simulator) but poorly on the real system
- **mental rehearsal** : In robot reinforcement learning, the learning step on the simulated system is often called “mental rehearsal”

1. Reinforcement learning in robotics: A survey
2. Sim-to-Real Transfer in Deep Reinforcement Learning for Robotics: a Survey
3. Towards Closing the Sim-to-Real Gap in Collaborative Multi-Robot Deep Reinforcement Learning
4. Sim-to-Real: Learning Agile Locomotion For Quadruped Robots
5. Dynamics Randomization Revisited: A Case Study for Quadrupedal Locomotion
6. Reinforcement Learning with Perturbed Rewards
7. Towards Closing the Sim-to-Real Gap in Collaborative Multi-Robot Deep Reinforcement Learning
8. Learning dexterous in-hand manipulation
9. Sim-To-Real via Sim-To-Sim: Data-Efficient Robotic Grasping via Randomized-To-Canonical Adaptation Networks
10. Closing the Sim-to-Real Loop: Adapting Simulation Randomization with Real World Experience
11. Analysis of Randomization Effects on Sim2Real Transfer in Reinforcement Learning for Robotic Manipulation Tasks
12. Sim2Real Transfer for Deep Reinforcement Learning with Stochastic State Transition Delays
13. DiAReL: Reinforcement Learning with Disturbance Awareness for Robust Sim2Real Policy Transfer in Robot Control
14. Reinforcement Learning with Adaptive Curriculum Dynamics Randomization for Fault-Tolerant Robot Control
15. Automatic Gait Optimization with Gaussian Process Regression
16. Exploiting Model Uncertainty Estimates for Safe Dynamic Control Learning
17. How to Sim2Real with Gaussian Processes: Prior Mean versus Kernels as Priors
18. Learning Vision-Guided Quadrupedal Locomotion End-to-End with Cross-Modal Transformers
19. Crossing the Gap: A Deep Dive into Zero-Shot Sim-to-Real Transfer for Dynamics
20. Trustworthy Reinforcement Learning Against Intrinsic Vulnerabilities:Robustness, Safety, and Generalizability

21. Discovering Blind Spots in Reinforcement Learning
22. TuneNet: One-Shot Residual Tuning for System Identification and Sim-to-Real Robot Task Transfer
23. Sim2Real2Sim: Bridging the Gap Between Simulation and Real-World in Flexible Object Manipulation
24. Sim2Real Transfer for Reinforcement Learning without Dynamics Randomization
25. Preparing for the Unknown: Learning a Universal Policy with Online System Identification
26. Modelling Generalized Forces with Reinforcement Learning for Sim-to-Real Transfer
27. Learning Active Task-Oriented Exploration Policies for Bridging the Sim-to-Real Gap
28. Deep Whole-Body Control: Learning a Unified Policy for Manipulation and Locomotion
29. Accurate Dynamics Models for Agile Drone Flight:Zero-Shot Sim2Real-Transfer of Neural Controllers
30. Unsupervised Domain Adaptation with Dynamics-Aware Rewards in Reinforcement Learning
31. Sim-to-real: Quadruped Robot Control with Deep Reinforcement Learning and Parallel Training
32. Closing the Sim-to-Real Gap for Ultra-Low-Cost, Resource-Constrained, Quadruped Robot Platforms
33. Adaptive periodic movement control for the four legged walking machine BISAM
34. Emergent synthesis of motion patterns for locomotion robots
35. Generation of GelSight Tactile Images for Sim2Real Learning
36. i-Sim2Real: Reinforcement Learning of Robotic Policies in Tight Human-Robot Interaction Loops
37. Self-improving Models for the Intelligent Digital Twin: Towards Closing the Reality-to-Simulation Gap
38. Agnostic System Identification for Model-Based Reinforcement Learning
39. Sim2Real Predictivity: Does Evaluation in Simulation Predict Real-World Performance?
40. Learning Bipedal Walking for Humanoids With Current Feedback
41. NeRF2Real: Sim2real Transfer of Vision-guided Bipedal Motion Skills using Neural Radiance Fields
42. Safety-Critical Controller Verification via Sim2Real Gap Quantification
43. Auto-Tuned Sim-to-Real Transfer
44. Parallel Learning: Overview and Perspective for Computational Learning Across Syn2Real and Sim2Real
45. Adaptability Preserving Domain Decomposition for Stabilizing Sim2Real Reinforcement Learning