Curriculum Reinforcement Learning

Self-paced Learning

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- There are different kinds of performance markers:

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- There are different kinds of performance markers:
    - Evaluation reward
    - Goals reached
    - Confidence in policy
    - Internal value function

Self-Paced Deep Reinforcement Learning Klink et al. 2020

▶ Goal: enable agent to solve specific very hard instances (common in robotics)

▶ Idea: define (easy) start distribution and (hard) goal distribution of instances, then slowly shift towards the goal

▶ Speed of the shifting depends on the agents state evaluations $V(s)$ as a progress measure

Curriculum Generation through Value Disagreement Sampling Zhang et al. 2020

- ▶ Idea: train an ensemble of agents and use the differences in their Q-values as a measure of uncertainty
- ▶ Goals are proposed at a point where the ensemble starts to disagree, assuming that agreement means all agents have learned a good policy on this instance already
- ▶ Note: currently this method is an extension of HER and thus only works if the transition function stays the same between instances.