Learning Priors for Scene Understanding on multi-temporal Reinforcement Learning

Yue Gao

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1 Abstract

Humans' visual scene navigation highly depends on how we continuously combines new information from our visual sensors with information it has acquired throughout life under muti-level temporal series. Based on experimental evidence, [1] it is clear that priors can change, however, it is unclear how these priors change over time and how it affects our posterior understanding of the scenes. Therefore, we want to propose a model using Bayesian theory to understand the effect of priors change on temporal domain.

(a) Saliency Map in SpatioTemporal Domain

Saliency Map is very helpful in object recognition and classification. Zhang [3],[4] has demonstrated how to compute a saliency map on a single image bases and also on a sequence of image bases. However, their approach was not considering how multi-level temporal domain could effect the saliency map of the scene. For example, in a scene, if we notice some repetition in the scene, our saliency map would have high interest in them but as time goes by, we have trained our prior that this repetition is a part of a scene,therefore, the saliency map should put less weight on the information and focus on the new object.

(a) Reinforcement Learning on multi-level time scale [2]

If we consider each saliency map as a reward, then for a robot navigating in an environment, without any task in mind, it should follow the path that leads to the most novelty and most gain. However, if the robots is navigated to a different environment, then it should rebuild its priors towards the environment.

(a) Questions

1. How to re-interpolate the temporal level saliency map. For example if on temporal domain.
2. Can the reward idea be part of our model?

References

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