Sparse Coding of Learned State Representations in Reinforcement Learning

Submission ID 3000324

Submission Type Poster

Topic Cognitive Science

Status Submitted

Submitter David Noelle

Affiliation University of California, Merced

SUBMISSION DETAILS

Presentation Type Either Poster or Oral Presentation

Presentation Abstract Summary Temporal Difference (TD) Learning is a leading account of the role of the dopamine system in reinforcement learning. TD Learning has been shown to fail to learn some fairly simple control tasks, however, challenging this explanation of reward-based learning. We conjecture that such failures do not arise in the brain because of the ubiquitous presence of lateral inhibition in the cortex, producing sparse distributed internal representations that support the learning of expected future reward. We provide support for this position by demonstrating the benefits of learned sparse representations for two problematic control tasks: mountain car and acrobat.

Paper Upload (PDF) submit.pdf

Co-author Information

* Presenting Author

First Name	Last Name	Affiliation	E-mail
David *	Noelle *	University of California, Merced	dnoelle@ucmerced.edu
Jacob	Rafati	University of California, Merced	jrafatiheravi@ucmerced.edu

Keywords

Keywords
reinforcement learning
sparse coding
dopamine

lateral inhibition
value function approximation