Title: Gene Regulated Neuromodulation

Tracks:

1/ Evolutionary Machine Learning

2/ Generative and Developmental Systems

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Do we add Jordan or are we playing alone this time?

Keywords:

Indirect encoding

Parameter tuning

Performance measures

Machine learning

Abstract (200 words max)

In this paper, we use a gene regulatory network (GRN) to regulate the learning parameter of State-Action-Reward-State-Action (SARSA) algorithm. The GRN tunes in real time the learning rate (alpha), the discount factor (gamma) and memorization level (lambda). We have optimized GRNs with a genetic algorithm to regulate these parameters on specific problems but with no knowledge of their structure. We show that GRN-regulated SARSA performs equality or better than the SARSA with fix parameters. This paper also presents the generalization capacity of our approach by training the GRN on two problems and generalizing the tuning strategy to unknown problems with no further optimization.