
JANE BREEN, Ontario Tech University

Reinforcement learning for algebraic graph theory: parallelizing Wagner's approach

In a recent paper by Wagner (see [1]), it was shown that using reinforcement learning with a cross-entropy approach, one can efficiently find or construct counterexamples to conjectured bounds in algebraic graph theory. This method was re-implemented in [2], and used to disprove several published conjectures in spectral graph theory. In this talk, I will discuss these algorithms and some applications, along with some adaptations to these approaches which may improve speed and efficiency.

This is joint work with Alix Bouffard.

[1] Adam Zsolt Wagner (2021). Constructions in combinatorics via neural networks. *arXiv:2104.14516*

[2] Mohammad Ghebleh, Salem Al-Yakoob, Ali Kanso, Dragan Stevanovic (2024). Reinforcement learning for graph theory, I. Reimplementation of Wagner's approach. *arXiv:2403.18429*