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Learning to Unknot

Wednesday 16 December 2020 18:30 (30 minutes)

We will apply the tools of Natural Language Processing (NLP) to problems in low-dimensional topology, some of which have direct applications to the smooth 4-dimensional Poincare conjecture. We will tackle the UNKNOT decision problem and discuss how reinforcement learning (RL) can find sequences of Markov moves and braid relations that simplify knots and can identify unknots by explicitly giving the sequence of unknotting actions. Based on recent work with James Halverson, Fabian Ruehle, and Piotr Sulkowski.

Presenter: GUKOV, Sergei (California Institute of Technology)

Session Classification: Physics meets ML seminar