

1145-VU-2732      **Mark Hughes** and **Spencer Reschke\*** (spencerreschke@gmail.com). *Deep Reinforcement Learning and Constructive Proofs in Topology.*

Abstract: Low-dimensional topology has numerous examples of problems whose solutions require constructing sequences of operations taken from a fixed set of moves. In knot theory, constructing genus-minimizing slice surfaces of a knot is an example of such a problem. In this talk we'll discuss how recent advances in deep reinforcement learning can be leveraged to construct these surfaces. In particular we'll discuss deep Q-learning and its modern improvements such as double Q-learning, dueling architectures, prioritized experience replay, and asynchronous methods. (Received September 25, 2018)