Reinforcement Learning and Learning to Promote Learning

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Enabling agents to learn to make good sequences of decisions through direct experience with the world is a critical aspect of artificial intelligence, and has enormous potential applications. In particular, this is a task that arises for artificial coaches that seek to support learning, such as intelligent tutoring systems. There is ample evidence better support is needed: in 2007 over one-fifth of entering college students required remedial education, and as of 2012 one half of US adults have at least one chronic health condition. 1:1 human tutoring, and personalized health coaches can be effective, but do not scale to the magnitude and temporal longevity of these issues. In my work I focus on creating reinforcement learning systems that efficiently and effectively learn to achieve a desired objective such as having all students master algebra. In this talk I'll discuss our work towards achieving this, which includes a significant effort on new algorithmic and theoretical work on foundational challenges in reinforcement learning.