Modeling MOOC Student Behavior With Two-Layer Hidden Markov Models

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ABSTRACT

Massive open online courses (MOOCs) provide educators with an abundance of data describing how students interact with the platform, but this data is highly underutilized today. This is in part due to the lack of sophisticated tools to provide interpretable and actionable summaries of huge amounts of MOOC activity present in log data. To address this problem, we propose a student behavior representation method alongside a method for automatically discovering those student behavior patterns by leveraging the click log data that can be obtained from the MOOC platform itself. Specifically, we propose the use of a two-layer hidden Markov model (2L-HMM) to extract our desired behavior representation, and show that patterns extracted by such a 2L-HMM are interpretable, meaningful, and unique. We demonstrate that features extracted from a trained 2L-HMM can be shown to correlate with educational outcomes.

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