Classifying Peer Tutee Learning Gains with Hidden Markov Models

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ABSTRACT

The ability to automatically distinguish between successful and deleterious patterns in collaborative learning sessions opens doors to improved opportunity for learning in pairs or groups even when a teacher might not be available to facilitate. In this study, data from one-time computer-based peer tutoring sessions are modeled using hidden Markov models (HMMs) to predict normalized gains from pre- to post-test in an experimental condition. Both cognitive and affective labels to tutor chats (human-coded) were included as well as tutee (in)correctness, undos, and chats back to the tutor. Performance of the HMM is favorable compared to a "static" logistic regression model using aggregated totals of the same observables. Some of the hidden states are readily interpretable, though deeper comparison between high- and low-gain groups is part of ongoing work.