DISSERTATION
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Modeling Temporal Dynamics of User Generated Content

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Abstract: The evolving nature of user generated content (UGC) lays the key characteristics of Web 2.0. The evolution process in UGC offers valuable evidence to explain the content dynamics in the past and predict trends in the future. In this thesis, we design models to analyze content evolution patterns of UGC in three granularities: words, topics and sentiment. More specifically, this thesis investigates content evolution in the following aspects: (1) on word-level dyanmics: analyzing word frequency change in collaboratively generated content and using historical word frequencies to better weigh the words in ranking functions; (2) on topic-level dynamics: learning temporal transition patterns of topics in microblog streams and predict future topics according to historical posts; (3) on sentiment-level dynamics: estimating and understanding different sentiment change patterns of popular political topics across different user groups. We show that the developed models enable new applications in UGC, such as improving content-based ranking, anticipating future popular topics and visualizing and interpreting sentiment dynamics.

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