**Topics over Time: A Non-Markov Continuous-Time Model of Topical Trends**

**Definition**: extends Latent Dirichlet Allocation (LDA) by jointly modeling word co-occurrences and document timestamps in continuous time

Unlike dynamic topic models that rely on discretized time windows or Markov assumptions, TOT assigns each topic a continuous probability distribution (Beta) over time. This enables the model to capture when topics emerge, peak, and decline, while keeping their semantic meaning constant.

TOT improves over LDA by producing more coherent and time-localized topics, and by avoiding mixing unrelated events separated in history. A study on 3 real world data sets shows that TOT delivers clearer temporal trends, more distinct topics (measured by KL divergence), and significantly better timestamp prediction from documents.