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TASRec-Full: A New Time-Aware Sequential Recommender with Aspect-Level Sentiment and Confidence Modeling for E-commerce

Communication Info

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Abstract

E-commerce recommendation is often treated as a next-item prediction task based only on user interaction histories, as in sequential recommendation models such as SASRec [1] and GRU4Rec [4], overlooking the rich preference signals contained in review text. This thesis proposes TASRec-Full, a sequential recommender that integrates aspect-level sentiment and its reliability into user modeling. For each interaction, an aspect sentiment vector is extracted from the review and paired with a confidence score. These signals are incorporated into a causal Transformer with time-aware embeddings to capture evolving user interests, inspired by time-aware self-attention modeling [2], while a fusion MLP produces ranking scores optimized with Bayesian Personalized Ranking (BPR) [3]. To reduce noise from uncertain textual information, a confidence-guided gating mechanism down-weights unreliable sentiment cues. Experiments conducted under a SASRec-comparable protocol on subsets of Amazon Reviews 2023 show that TASRec-Full outperforms strong baselines such as SASRec [1], GRU4Rec [4], and DeepFM [5]. Ablation studies further confirm the contribution of aspect sentiment, confidence gating, and temporal modeling to recommendation performance.

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