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*Knowledge-Aware User Intent Inference for Web Search and
Conversational Agents*

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Abstract: User intent inference is a critical step in designing intelligent information systems (e.g., conversational agents and e-commerce search engines). Accurate user intent inference improves user experience and satisfaction, but is a challenging task since user utterances or queries can be short, ambiguous, and contextually dependent. Moreover, in an e-commerce setting, the collected datasets are often labeled by weak supervision (e.g., click-through data), resulting in an imbalanced and sparse dataset. To address these problems, my dissertation proposes integrating entity knowledge-bases, conversation context, and user profile information to improve user intent inference for conversational agents. Additionally, I investigate joint learning, product taxonomies, and unlabeled domain-specific corpora (e.g., catalog) to improve query intent inference in e-commerce search.

To evaluate the proposed models, I examine the user intent inference for two main settings: 1) open-domain conversational agents and 2) e-commerce search engines. The conversational agent research is evaluated on conversations collected from real users as part of Amazon Alexa Prize competitions, and the e-commerce efforts use real query logs collected from The Home Depot's search engine. My dissertation shows that leveraging entity knowledge-base, conversation context, and user profile information accounts for most improvements for the conversational setting. The results demonstrate that the proposed models significantly enhance topic classification accuracy by

15

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<https://zoom.us/j/9912158487?pwd=aURCWjVpY1BmVzBaSDB6QktmZ2xvZz09>

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