

## **Dynamic bayesian networks in Classification-and-Ranking Architecture of Response Generation**

### **ABSTRACT**

**Problem statement:** The first component in classification-and-ranking architecture is a Bayesian classifier that classifies user utterances into response classes based on their semantic and pragmatic interpretations. Bayesian networks are sufficient if data is limited to single user input utterance. However, if the classifier is able to collate features from a sequence of previous  $n-1$  user utterances, the additional information may or may not improve the accuracy rate in response classification. **Approach:** This article investigates the use of dynamic Bayesian networks to include time-series information in the form of extended features from preceding utterances. The experiment was conducted on SCHISMA corpus, which is a mixed-initiative, transaction dialogue in theater reservation. **Results:** The results show that classification accuracy is improved, but rather insignificantly. The accuracy rate tends to deteriorate as time-span of dialogue is increased. **Conclusion:** Although every response utterance reflects form and behavior that are expected by the preceding utterance, influence of meaning and intentions diminishes throughout time as the conversation stretches to longer duration.

**Keyword:** Bayesian networks; Conditional Probability Distributions (CPDs); Dynamic Bayesian networks; Probabilistic Network Libraries (PNL); Classification-and-ranking, Directed-Acyclic Graph (DAG)