

# Conversational recommender system for laptops using ontology

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## Abstract

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## 1 Introduction

Artificial neural networks (ANN) have demonstrated strong performance in numerous tasks, but they consume enormous amounts of power due to intensive computational and memory demands. Spiking neural networks (SNNs), inspired by the human brain and offering energy-efficient alternatives. However, popular training methods for SNNs, Spatial Temporal Back-propagation (STBP) and ANN-SNN Conversion, both suffer from the challenge of inference latency. To address this issue, Hao et al. **hao2024faster** proposed a parallel spiking framework. In this work, we adapt the Parallel Conversion (PC) framework for text type data tasks. We also validate the performance of PC on the widely used BERT model.

## 2 Related Works

Currently, numerous recommend systems have been developed to provide laptop suggestions tailored to user needs. These systems illustrate different approaches to handling user requirements, ranging from content-based and collaborative filtering methods to ontology-based models. As a result, a considerable body of prior research exists in this domain, offering valuable insights and serving as important references for ongoing and future studies.

Bahramian and Abbaspour (2015) developed an ontology-based tourism recommend system that applied a spreading activation model to enhance personalization. Their system represented both user preferences and points of interest (POIs) through an ontology, dynamically adapted recommendations with feedback, and addressed cold-start and sparsity problems. The results showed improved diversity and relevance in recommendations.

Ayundhita et al. (2019) investigated a laptop recommend system using an Ontology-Based Conversational Recommend System (CRS). Their approach integrated ontological

reasoning with interactive questioning to capture user requirements more effectively. Experimental evaluation showed that the system achieved an accuracy of 84.6% when tested with functionality requirement questions.

Putra and Baizal (2024) proposed a hybrid laptop recommend system that combined ontology-based filtering with collaborative filtering in a conversational framework. The ontology component mapped functional requirements to technical specifications, while collaborative filtering introduced diversity by leveraging similar user preferences. Their system achieved 93.33% accuracy, outperforming earlier ontology-only approaches.

Based on previous studies, we will develop an ontology-based recommend system incorporating the Collaborative Filtering (CF) method to recommend laptops based on daily user needs.

## Ontology-Based Recommend System

An ontology-based recommend system is a type of recommend system that utilize ontology - formal representations of knowledge within a specific domain. Such systems are particularly advantageous in domains like the Semantic Web (SW), Artificial Intelligence (AI), and Systems Engineering (SE), where complex relationship must be analyzing and modeling. Implementing an Ontology-Based Recommend system involves developing an ontology related to a particular domain or topic, involving concepts, relations, and rules. Researchers evaluate the similarity between user preferences and ontology by using it to model user preferences

## Collaborative Filtering

Recommend system provides personalize recommendations to users base on their interest. One of most popular type of such system is Collaborative Filtering (CF), operating the prediction based on the known user ratings of items (Zhang2014).

## References

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