Conversational recommender system for laptops using ontology

Tuan Mai Chan, Khoa Lang Huynh Dang

September 15, 2025

Abstract

Escreva seu resumo em língua estrangeira (inglês)...

Resumo. Resumo do trabalho (português)...

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 recommender 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 Bahramian and Abbaspour, 2015 developed an ontology-based tourism recommender 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. Ayundhita et al., 2019 investigated a laptop recommender system using an Ontology-Based Conversational Recommender 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 Putra and Baizal, 2024 proposed a hybrid laptop recommender 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.

References

Ayundhita, M. S., Baizal, Z. K. A., & Sibaroni, Y. (2019). Ontology-based conversational recommender system for recommending laptop. *Journal of Physics: Conference Series*, *1192*(1), 012020. https://doi.org/10.1088/1742-6596/1192/1/012020

Bahramian, Z., & Abbaspour, R. A. (2015). An ontology-based tourism recommender system based on spreading activation model. *International Conference on Sensors & Models in Remote Sensing & Photogrammetry*, *XL-1/W5*, 83–90. https://doi.org/10.5194/isprsarchives-XL-1-W5-83-2015

Putra, A. D. A., & Baizal, Z. K. A. (2024). Laptop recommender system using the hybrid of ontology-based and collaborative filtering. *Sinkron: Jurnal dan Penelitian Teknik Informatika*, *8*(2), 892–901. https://doi.org/10.33395/v8i2.13370