

Exploring Neuro-symbolic Pipelines for Structured Knowledge Extraction

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Abstract

Abstract here.

Chapter 1

Introduction

Nothing here yet.

Chapter 2

Systematic Literature Review

2.1 Introduction

This chapter details the Systematic Literature Review (SLR) conducted to establish the theoretical foundations of Neuro-Symbolic AI.

2.2 Methodology

PRISMA guidelines.

2.2.1 Research Questions

2.2.2 Research Strategy

Database: Scopus Date Range: 2023–2026 Language: English Query: ("Large Language Model" OR "LLM") AND ("SHACL" OR "SPARQL") AND ("Semantic Web" OR "Knowledge Graph")

2.2.3 Inclusion/Exclusion Criteria

During screening: Exclude usage of KGs for XAI. Include explainability if it's tested on our use case. Exclude Conference Proceedings Entries. Include SPARQL query generation by LLM from natural language questions. Exclude graph entity alignment. Exclude "conceptual", "theoretical" and "preliminary results". Exclude opposite flow: using LLM to produce natural language FROM SPARQL. Exclude off-topic usage of LLMs (e.g. not as part of the same data pipeline as the KGs). Exclude comparisons between LLM approaches and Semantic web approaches. Include prompt engineering comparisons (for the same task as our

pipeline). Exclude it for different or generic applications. Include fine-tuning for use with KGs. Exclude otherwise. Exclude subgraph extraction by LLM.

2.3 Results

Results: 125 Duplicates: 3 Screened: 122

2.4 Thematic Analysis

2.4.1

2.4.2

2.4.3

2.5 Discussion and Research Gap

Bibliography

- [1] J. Smith, “Llms for legal logic,” *Journal of AI Law*, 2023.