

## Background

- Conversational AI has expanded rapidly in recent years.
- Conversational AI in practical use experiences issues and can be vastly improved.

## Why KGs?

- Relevant Information: A KG provides a structured way of storing and representing data, allowing a chatbot to access relevant information more effectively.
- Comprehensive Information: A KG interconnects knowledge by providing extensive relationships among nodes, allowing a chatbot to provide comprehensive answers.
- Scalability: A chatbot based on KGs does not require large amounts of training data or lengthy training periods.
- Adaptability: The ability of the chatbot to learn and adapt as new information becomes available depends solely on updating and refining the KG.

## Chatbot Construction

- Data was collected through preexisting Kaggle datasets and web scraping (for data that could not be found).
- The KG was created by importing TTL files generated from the datasets and custom mapping files into Apache Jena Fuseki.
- SPARQL queries can be crafted to extract data from the KG.

## Goals

- Improve the state of the art in conversational AI beyond current status using KGs
- Expand use of conversational AI beyond current levels

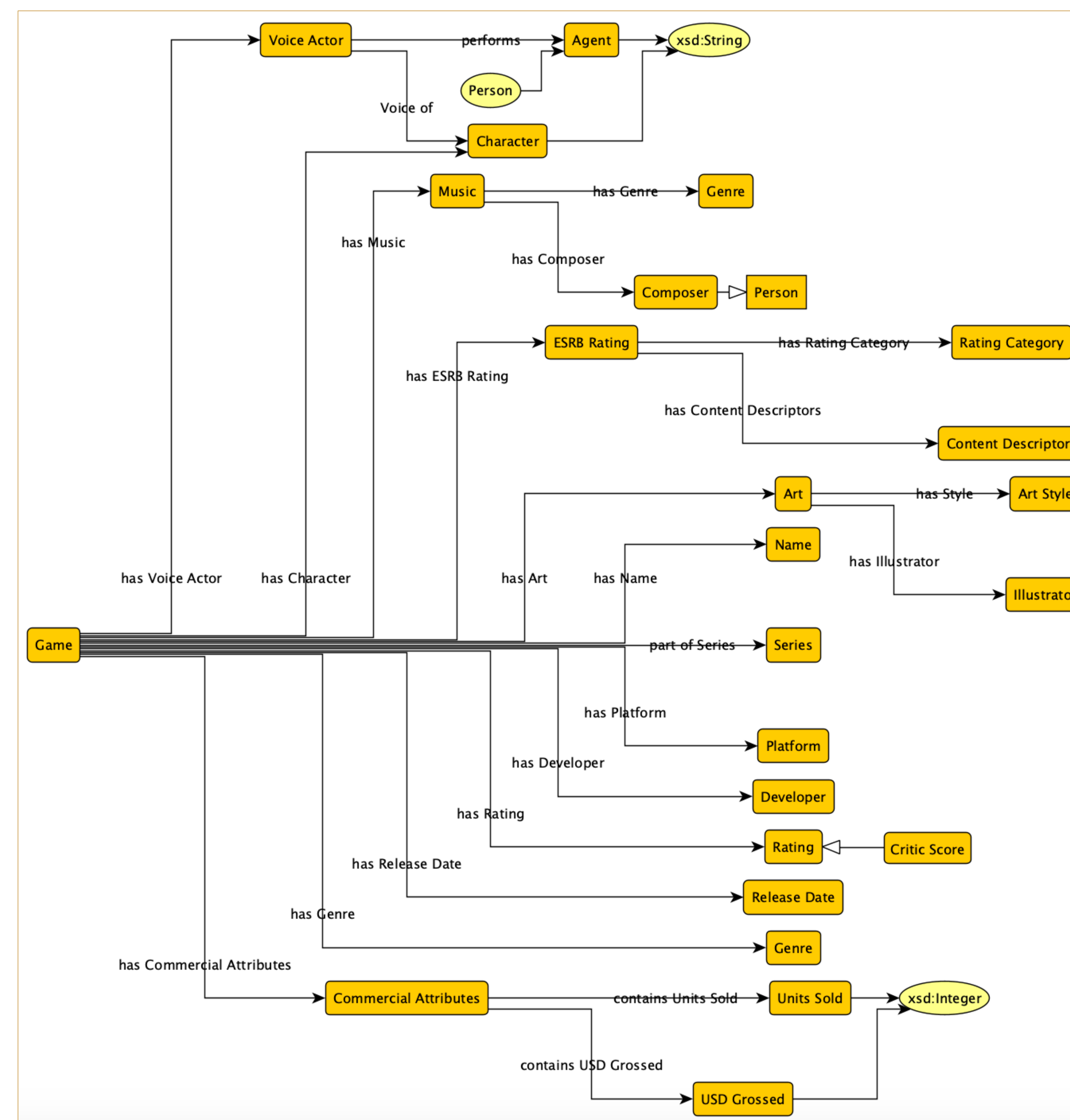


Figure 1: Video Game Schema

## References

- GitHub Repository: <https://github.com/kastle-lab/kg-chatbot>
- [1] Kejriwal, M., Knoblock, C.A. and Szekely, P. (2021) *Knowledge Graphs: Fundamentals, Techniques, and Applications*. Cambridge, MA: The MIT Press.
- [2] Dragoni, M., Rizzo, G. and Senese, M.A. (2021) 'Convology: An ontology for conversational agents in Digital Health', *Web Semantics*, pp. 7–21. doi:10.1016/b978-0-12-822468-7.00004-3.

## Preliminary Research

- A Knowledge Graph (KG) is a set of triples used to represent relationships among various data.
- A Large Language Model (LLM) is a deep learning algorithm that can perform Natural Language Processing (NLP) tasks based on knowledge gained from massive datasets.
- Convology (CONVersational ontOLOGY) is a top-level ontology aiming to model the conversation scenario for supporting the development of conversational knowledge-based systems.

## Future Work

- NLP on user input to extract and recognize entities
- SPARQL query generation from extracted entities
- Conversion of resulting data into natural language using Natural Language Generation (NLG)

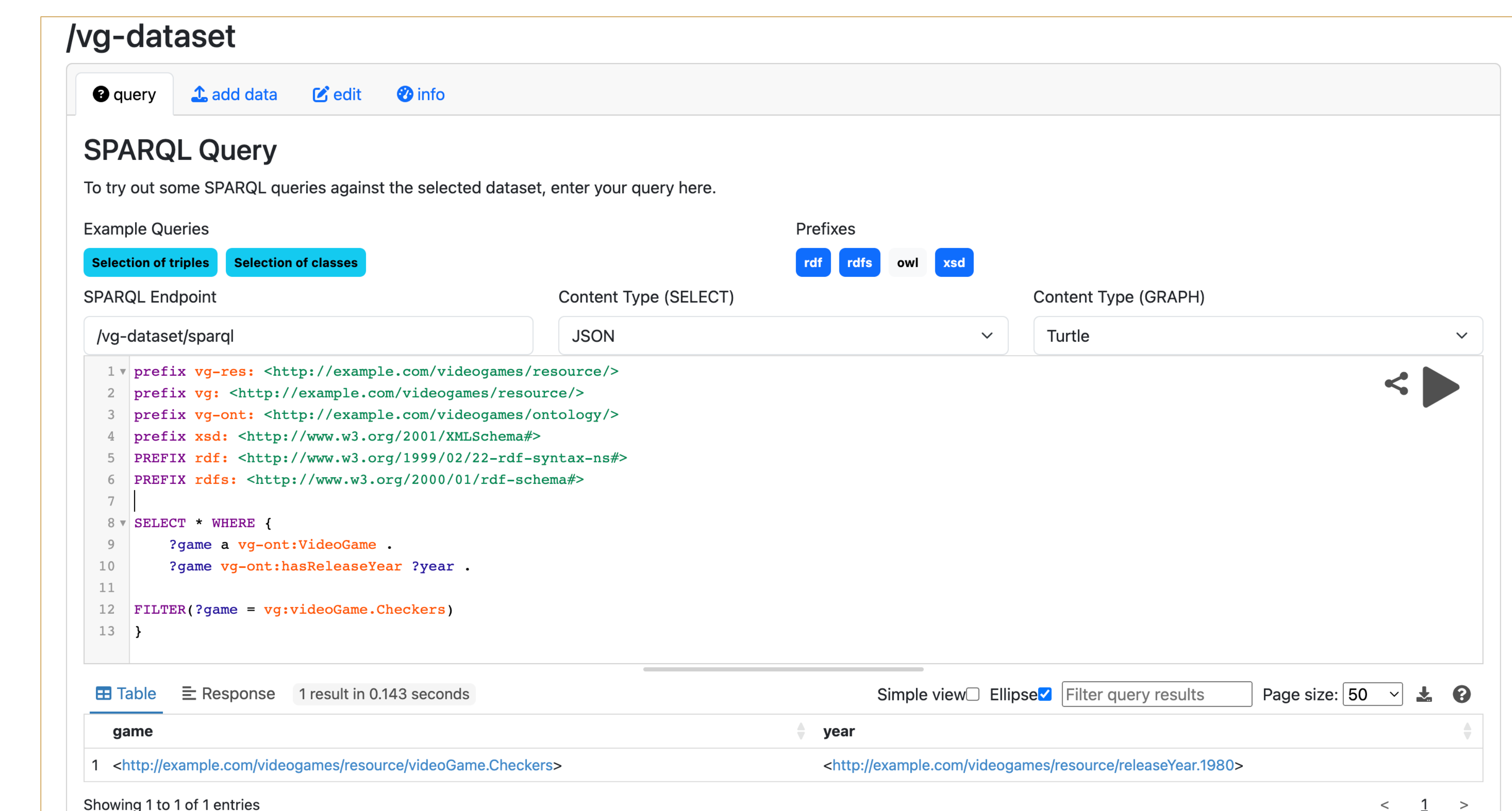


Figure 2: SPARQL Query