

IMPROVING KNOWLEDGE GRAPH UNDERSTANDING WITH CONTEXTUAL VIEWS

Antrea Christou ,Dr Cogan Shimizu
christou.2@wright.edu, cogan.shimizu@wright.edu
College of Engineering and Computer Science



Introduction

- Navigating large, complex knowledge graphs can be challenging, and traditional tools for exploration and analysis may not be sufficient.
- The Ink Browser is a web-based tool designed to support interactive exploration of knowledge graphs, while flexible views enable users to customize the display of the graph to meet their needs.

Why use the Ink Browser

- Flexible view is an example of one of the advanced features of the Shapes Constraint Language (SHACL), which is used by the Ink Browser to define constraints on RDF data. It enables more sophisticated and nuanced constraint definition and validation for RDF data.

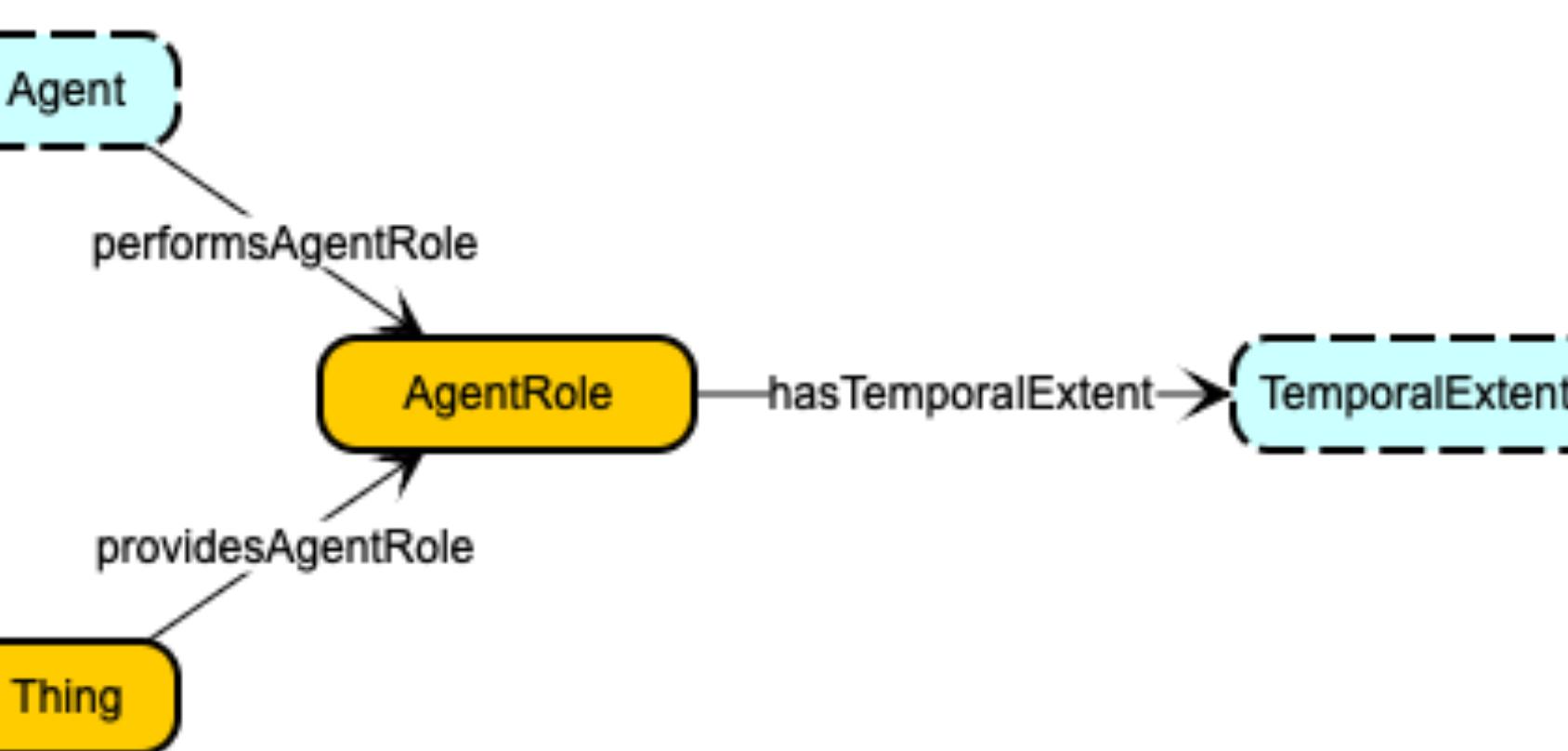
ink-browser

The Ink Browser interface includes:

- A table titled "Earthquakes" with columns: Depth, Gap, Error, Mag. Data rows include: ak02115pn6u (159, 6, 24, 4), ak02153n5s1 (237, 9, 37, 4.3), ak021b6xmj (262, 16, 24, 6), nn00792158 (305, 3.7, 67, 4.3), pr2020359052 (356, 16, 49, 3.9).
- A map of Ohio showing locations like Columbus, Dayton, and Cincinnati.
- A graph visualization showing entities like "Earthquake", "ObservationCollection", "FeatureOfInterest", "Hazard", and "Feature".
- A search bar with a "Lookup Schema" dropdown and a "SEARCH" button.
- A sidebar with a "Statistics" dropdown and other navigation options.

Dynamically Creating KG Views

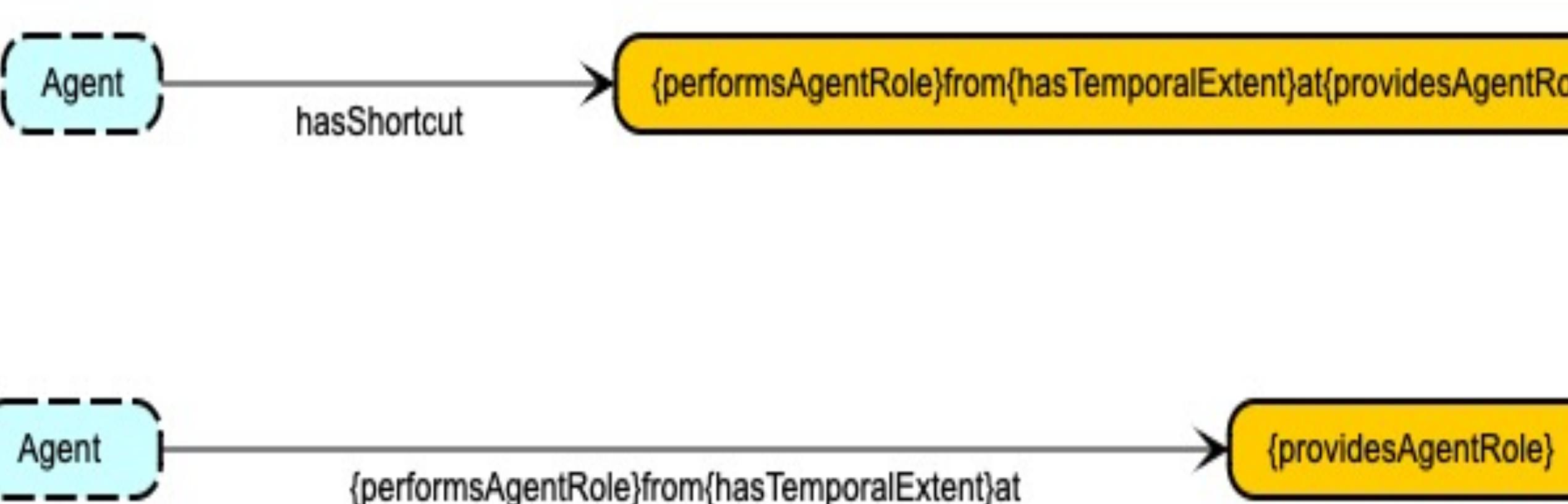
We can map extracted information to KG nodes and connections by extracting features such module names, descriptions, characteristics, and relationships. This makes it simpler to deal with and manage complicated systems because it makes it possible to quickly identify and analyze the links and organizational structure between various modules.



```
= RESTART: /Users/andreachristou/Documents/git/Independent-Study-Antrea/code/shorcute_generation.py
Agent Node ID: n0
Paths with outgoing edges:
1. performsAgentRole
2. performsAgentRole -> hasTemporalExtent

Paths with incoming edges:
1. performsAgentRole -> providesAgentRole
```

Shortcut Visualization



Example Output

```
@prefix kastle-lab: <http://kastle-lab.org/> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .
kastle-lab:Agent Antrea kastle-lab:GradStudent_from_2018-2021_at
"CIIM"^^xsd:string ;
kastle-lab:GradStudent_from_2021-present_at
"WrightStateUniversity"^^xsd:string ;
kastle-lab:Intern_from_June2018-December2018_at
"BankofCyprus"^^xsd:string ;
kastle-lab:UndergradStudent_from_2015-2018_at
"UniversityofLeeds"^^xsd:string .
```

Conclusions/References

- By evaluating the effectiveness of these tools, we can gain a better understanding of how they can be used to support knowledge graph exploration and analysis, and identify areas for future research and development.

- Modl patterns found here : (<https://github.com/kastle-lab/modular-ontology-design-library>)
 - <https://github.com/kastle-lab/Independent-Study-Antrea>
- [1] Ink browser { The interactive knowledge browser - kansas state university. (n.d.). Retrieved April 6, 2023, from https://daselab.cs.ksu.edu/sites/default/files/2021_ISWC_PD_Ink_Browser.pdf
- [2] R. S. Chittella, “Leveraging schema information for improved knowledge graph navigation,” CORE Scholar. [Online]. Available: https://corescholar.libraries.wright.edu/etd_all/2120/. [Accessed: 06-Apr-2023].
- [3]“Wisp: Weighted shortest paths for RDF graphs - aidanhogan.com.” [Online]. Available: <https://www.aidanhogan.com/docs/WISP-shortest-paths-rdf-graphs.pdf>. [Accessed: 06-Apr-2023].
- [4] B. Regalia, K. Janowicz, and G. Mai, “[PDF] phuzzy.link: A SPARQL-powered client-sided extensible semantic web browser: Semantic scholar,” [PDF] Phuzzy.link: A SPARQL-powered Client-Sided Extensible Semantic Web Browser | Semantic Scholar, 01-Jan-1970. [Online]. Available: <https://www.semanticscholar.org/paper/Phuzzy.link%3A-A-SPARQL-powered-Client-Sided-Semantic-Regalia-Janowicz/93414a73dc811c7edca6a23faa6433cd1cc0c625>. [Accessed: 06-Apr-2023].