Incremental Reasoning on RDFS
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**Evolving Data**

<table>
<thead>
<tr>
<th>Inference time (in ms.)</th>
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</tbody>
</table>

**Implicit Triples**

- subClassOf1000

**Explicit Triples**

- subClassOf100

- subClassOf50

- subClassOf200

- subClassOf1000

**REFERENCES**


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**CONTEXT**

The Semantic Web enables to:
- describe knowledge from data
- leverage implicit knowledge through reasoning algorithms

The main limitations of current reasoning methods are:
- lack of scalability for large datasets
- inability to reason over knowledge from evolving data

We contribute to solving these problems by introducing Slider, an efficient incremental reasoner.

**MAIN FEATURES**

- **Parallel and Scalable Execution**: Each inference rule is mapped to an independent module, receiving intended triples and later distributing them to other modules for further processing.
- **Duplicates Limitation**: Vertical partitioning [1] and multiple indexing limit the production of duplicates and avoid unnecessary computation.
- **Data Stream Support**: Slider can handle both dynamic triple streams and static triples sets by employing parallel architecture.
- **Fragment’s Customization**: Slider natively support both RDFS [4] and ρdf [5] fragments, and can be extended to any other fragments.

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**ARCHITECTURAL OVERVIEW**

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**EXPERIMENTATIONS**

- Comparison with OWLIM-SE [2]
- Inference on both RDFS and ρdf
- 13 different ontologies
  - 5 generated with BSBM [3]
  - 2 from real-world datasets
  - 6 subClassOf ontologies
- 106.86% improvement for ρdf
- 36.08% improvement for RDFS
- 71.47% improvement in average

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**FUTURE WORK**

- Implementation of more complex inference rules, to provide reasoning over more complex fragments.
- Just-in-time optimisations of the rules execution’s scheduling.
- Use of previous runs informations to adapt and be more reactive.

**SOURCE CODE AND DEMO**

The source code is available here: [https://github.com/juleschevalier/slider](https://github.com/juleschevalier/slider)

A demo can be found here: [http://demo-satin.telecom-st-etienne.fr/slider/](http://demo-satin.telecom-st-etienne.fr/slider/)

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