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**Incremental Reasoning on RDFS**

**Jules Chevalier, Julien Subercaze, Christophe Gravier, Frédérique Laforest**

Université de Lyon, F-42023, Saint-Étienne, France, CNRS, UMR5516, Laboratoire Hubert Curien, F-42000, Saint-Étienne, France, Université de Saint-Etienne, Jean Monnet, F-42000, Saint-Étienne, France.

{jules.chevalier,julien.subercaze,christophe.gravier,frederique.laforest}@univ-st-etienne.fr

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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**

![Slider Architecture Diagram]

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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-word datasets
  - 6 subClassOf ontologies
- **106.86% improvement for ρdf**
- **36.08% improvement for RDFS**
- **71.47% improvement in average**

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**References**


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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.

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**Source Code and Demo**

The source code is available here: https://github.com/juleschevalier/slider
A demo can be found here: http://demo-satin.telecom-st-etienne.fr/slider/

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