OptiSparql

Modeling Interdependent Preferences over Incomplete Knowledge Graph Query Answers

MOTIVATION

- **Conjunctive** queries (AND operations) can unexpectedly lead to **empty result sets**
- **OPTIONAL** queries can lead to extensively **massive** and intransparent result sets
- **Preferences** model explicit wishes naturallly over incomplete data sets
- Some **preferences may depend** on other wishes to be fulfilled (as shown in the example)
- Our previous work lacks this ability

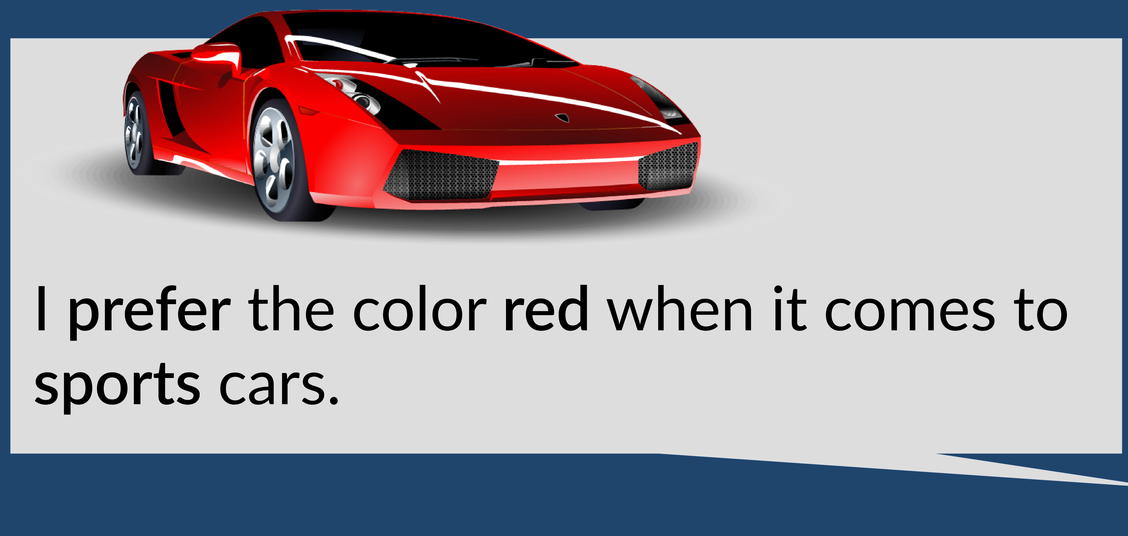
STRUCTURE

1. Isolate common types of **use cases** of inter-dependent preference models
2. Develop a **syntax** that is easy to understand and as concise as possible
3. Derive how these queries should be handled **semantically**
4. Extend our existing **query rewriting** technique to accomodate for our modifications
5. Discuss **performance** implications

RESULTS

- Preferences deliver results somewhere **between conjunctions** and **OPTIONAL** patterns
- Framework already usable via **query rewriting**
- **New operators** solve modeling problems of our framework
- **No known performance** impacts compared to our original framework

Preferences offer an intuitive way to retrieve complex data structures from incomplete knowledge graphs.



I prefer the color red when it comes to sports cars.

Take a picture to download the full paper

Examples

$?car\ is\_a$ Car OPTIMAL $(?car\ color\ ?color)$

Minimal example of our framework

```
SELECT ?car ?manufacturer ?region ?color
WHERE {
  ?car a :Car
  OPTIMAL (
    {
      ?car :manufacturer ?manufacturer .
      BIND(1 AS ?has_manufacturer)
    },
    {
      ?manufacturer :based_in ?region
      FILTER( bound(?has_manufacturer) )
    },
    {
      ?car :color ?color
    }
  )
}
```

Dependencies prior to our revision

```
SELECT ?car ?manufacturer ?country ?color
WHERE {
  ?car a :Car
  OPTIMAL(
    { ?car :made_by ?manufacturer }
    THEN {
      ?manufacturer :based_in ?country
    },
    { ?car :color ?color }
  )
}
```

Dependencies after our revision

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