Schema Discovery in RDF Datasets

Kenza Kellou-Menouer
kenza.menouer@uvsq.fr

Zoubida Kedad
zoubida.kedad@uvsq.fr

CONTEXT: Linked Data on the Web
- Structureless
- Incomplete type information
- Noisy

GOAL: Automatic Schema Extraction
- Types
- Semantic links
- Hierarchical links

TYPE DISCOVERY
- Density-based clustering
  - Groups data according to the neighbors density
  - Robust to noise and deterministic
  - Detects classes of arbitrary shape
  - No required number of classes
- Automatic detection of similarity threshold
  - According to the density distribution of the dataset
- Type profiles
  - Type properties with their frequencies
  - Probability for an instance of a type to have a property
    Example: « Conference »
    <(URL, 0.5), (date, 1), (made, 1), (isHeldAt, 1), (authorList, 1)>
- Overlapping types
  - Identification of the important properties for the types
  - Comparison of type profiles

LINK DISCOVERY
- Semantic links
  - Inferred from user-defined properties in the initial dataset
  - Considering the direction of properties in the type profiles
- Hierarchical links
  - Hierarchical clustering of type profiles

TYPE ANNOTATION
- Types extracted from a knowledge base
- Name based annotation
  - Searching for the types of resources having the same value of the name property
- Property based annotation
  - Searching for the types of resources having the same properties than the type profile, using WordNet for terminological conflicts
- Vocabulary based annotation
  - Searching for the domain/range of the properties in a standard vocabulary

USE CASE
- Initial Dataset
- Type Discovery
- Resulting Schema

EXPERIMENTATION
Automatic detection of similarity threshold
Evaluation of schema discovery quality in Conference (a) BNF (b) and DBpedia (c) datasets