Visualizing Multi-Document Semantics via Open Domain Information Extraction

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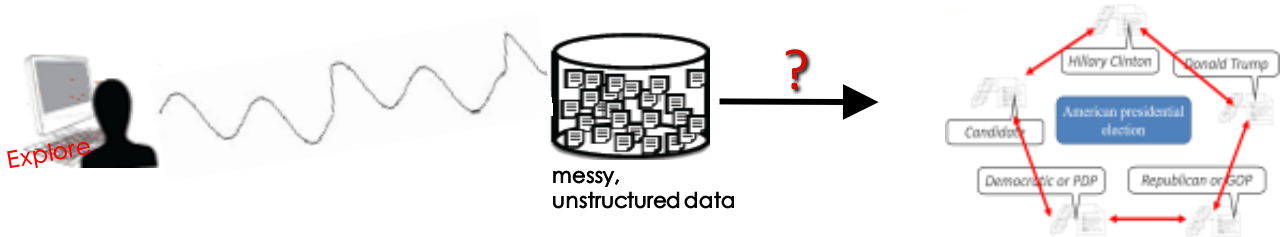
Motivation

This is challenging to mine and organize meaningful concepts and their semantic connections from a set of related documents under the same topic in the information extraction.



Design and Implementation

Step$_1$

Fact Extraction

- Document Ranking
- Coreference Resolution
- Open-Domain Knowledge Extraction

Step$_2$

Fact Filtering

- Fact filtering algorithm

This is achieved by optimizing for a high degree of coherence between facts with high confidence.

Step$_3$

Conceptual Graph Construction

- Merge potential entities and concepts, whose labels present equivalent meanings.
- **A heuristic algorithm** to find a full graph that is connected and satisfies the size limit of 25 concepts.

Example of the user interface

Backend

- Parsing text documents, pronouns and other forms of coreference are resolved using **Stanford CoreNLP** tool.
- Fact extraction is based on a publicly available system for open information extraction, namely the **KnowItAll Open IE 4.**
- All data is stored in a **MySQL** database.
- Our system is implemented in **Java**, with **Apache Tomcat** as the Web server.

Frontend

- **Topic Keywords Selection:** This view allows users to pick topics based on keywords as queries.
- **Document View:** This view provides a list of documents. Users can browse the full text of the document,
- **Knowledge Extraction View:** Users can extract all facts candidates from multiple documents.
- **Conceptual Graph:** Users can more easily explore the strong connections, and user-selected entities or concepts are highlighted,

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