SEMDIS

Knowledge Discovery in the Semantic Web
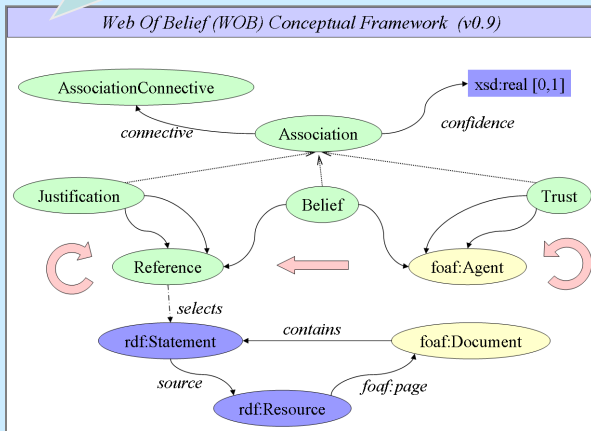
Objective

Design, prototype and evaluate a system supporting the discovery, indexing, querying, and ranking of complex semantic relationships on the Semantic Web. The system maintains and utilizes trust, provenance, and ranking information to enhance relationship discovery.

Approach

Knowledge representation systems reason over semantic web RDF graphs of metadata obtained with ontology-based process. Metadata. Can also be reduced to triples that can be stored in relational databases. In the Web of Belief, trust models and heuristics guide the formation of conclusions.
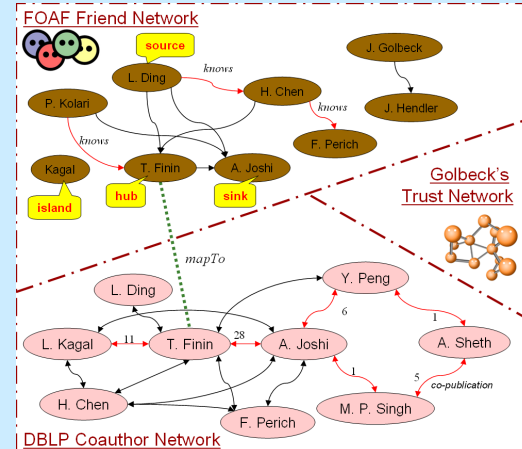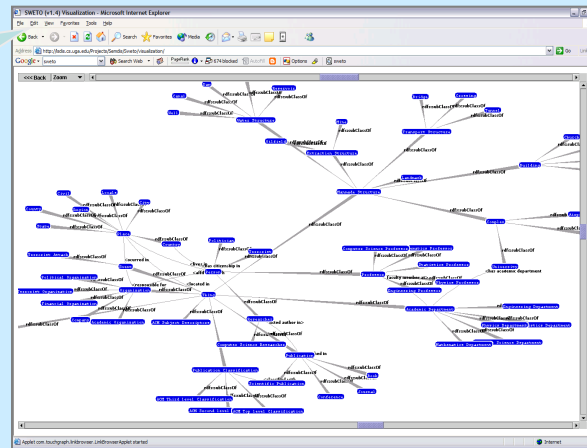
Broader impacts

Techniques and prototypes developed can be applied to a range of problems, including discovering new connections and relations in scientific information and homeland security. Research take to next generation of processing of Web content, from document-centric to relationship-centric.

SWETO

SWETO is large ontology covering several test-bed domains. Ver. 1.4 is populated with 800K instances and over 1.5M relations extracted from heterogeneous Web sources. SWETO was developed using Semagix Freedom system.
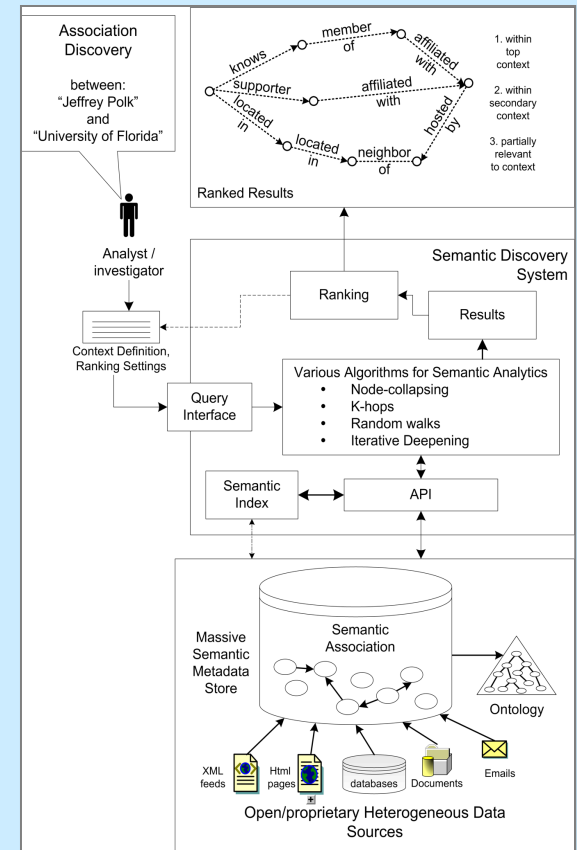
Web Of Belief (WOB) Framework

A "web of belief" models the entities and associations in the Semantic Web. With the concepts of agent, knowledge, trust, belief and justification, it represents, integrates, and evaluates conclusions drawn from the large volume of heterogeneous in-formation sources.

Web Of Belief (WOB) Conceptual Framework (v0.9)

FOAF Friend Network

Golbeck's Trust Network

DBLP Coauthor Network

Information from various online information sources is integrated to model trust relationships.

Association Discovery between: "Jeffrey Polk" and "University of Florida"

Ranked Results

1. within top context
2. within secondary context
3. partially relevant to context

Semantic Discovery System

Analyst / investigator

Context Definition, Ranking Settings

Query Interface

Ranking

Results

Various Algorithms for Semantic Analytics
- Node-collapsing
- K-hops
- Random walks
- Iterative Deepening

Semantic Index

API

Massive Semantic Metadata Store

Semantic Association

Ontology

XML feeds Html pages databases Documents Emails

Open/proprietary Heterogeneous Data Sources

An experimental algorithm has been developed and evaluated to integrate and rank discovered relationships.

http://lsdis.cs.uga.edu/Projects/SemDis

http://semdis.umbc.edu/