Project 12: Semantic Integration Portal

A facility to amalgamate diverse semantic data sources using ontology mapping techniques

**Current Implementation**

- **Terrorist Knowledge Base**
- **Profiles In Terror**
- **Populated Ontology**
- **Semantic Integration Engine**
- **mspace: Semantic Data Browser**

**Future Iterations**

- **Integration Script**
- **3Store**
- **On-the-fly semantic integration and reasoner**
- **SPARQL Query**

**Future Work**

- **Semantic Integration Technologies**
  - Semantic integration technologies (for example CROSI) to be applied to the problem of ontology mapping.
  - Existing work and new research to augment semantic integration, leading to automated and semi-automated solutions.
  - End result: data persisted in separate ontologies, with integration techniques and reasoners being able to integrate data ‘on the fly’.
- **Different visualisations**
  - Next-generation mspace browser to allow browsing of targeted RDF data.
  - Graphical tools, such as Prefuse, to provide effective visualisation of integrated data, adding value to integration portal.
- **Wider range of data sources**
  - Future iterations of the Semantic Integration Portal to include more diverse data sources, some of which will be unstructured data from the web.
  - This allows a complete end-to-end system of data from structured, semi-structured and unstructured sources, using a variety of ontologies from potentially multiple domains, producing a unified web-based output.

**Current Features**

- **Proof-of-concept**
  - Demonstrates value of semantic integration from structured and semi-structured sources.
  - Data already in populated ontologies: MIPT Terrorist Knowledge Base and Profiles In Terror.
  - Output – in this case an mspace semantic browser – allows users to choose either or both data sources to be displayed.
- **Manual integration allowing accurate concept mapping**
  - Manually-created ontology equivalences give accurate, if workload-heavy, relations between classes and instances.
  - Integration script (written in Perl) allows quick conversion of instances from one ontology to another.
- **Already useful data source for terrorist incidents**
  - Even as a proof-of-concept prototype, the Semantic Integration Portal shows useful data that can be updated from live internet sources.

International Technology Alliance in Network and Information Sciences