

Context Based Information Trust Analysis for Threat Detection

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Project Scope: Finding the most relevant and critical set of information in response to an information request of a Homeland Security analyst in the availability of today's vast amount of digital data is a challenging problem. Context Based Information Trust Analysis (CONITA) is designed to filter and present the most relevant (content and trust relevant) information for the analyst to enhance threat detection. The Content Relevance of the information (e.g., documents) presented to a user in response to an information request is measured based on the semantics of the request and the interests of the analyst within the Homeland Security domain. We utilize a Terrorism Ontology to specify the semantics of the corpus of information being analyzed/queried; the interests of a user in the domain are specified via an Interest Ontology. When an information request is issued by a user, the Terrorism Ontology along with Wordnet is used to increase Content Relevance, taking advantage of the semantic information in the Terrorism Ontology. Since trust is context dependent, in CONITA, the trustworthiness of the documents is then determined based on its application and the user's interest.

Recent Progress: Currently CONITA's prototype implementation is about to be completed. The content relevance part is already implemented and we are in the process of utilizing a terrorism ontology to greatly increase relevance. The trustworthiness part is in the experimentation stage; the two parts are planned to be integrated within a short time.

Future Plans: In this project, quality of the ontologies used is critical in returning the relevant results. Thus, we are especially interested in refining the interest ontologies. In addition, trust measures can be improved by exploring the other applications and also by narrowing the focus within the applications. It is also our highest interest to test the CONITA's performance with DHS analysts to better customize the framework for their needs.

Relevance to listed research areas: Although CONITA can be best described as a part of "Advanced Data Analysis", the span of the project covers threat analysis in most of the specified areas (biological, chemical, food, transportation, and infrastructure).

Publications: At present, we have internal reports on CONITA that are being submitted for publication. Several research papers from the Semantic Information Research Laboratory that are CONITA-related can be found at <http://sir-lab.usc.edu>.