



Semantic frameworks to enhance situation awareness for defence and security applications

**Soutenance d'Habilitation à Diriger des Recherches – Valentina Dragos
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Jury members:

Salima Benbernou, Professor, University of Paris, France
Joel Brynielsson, Research Director, Swedish Defence Research Agency, (FOI), Sweden
Iris Taravella-Eshkol, Professor, University of Paris-Nanterre, France
Aldo Napoli, Research Director, Center for Risk and Crisis Analysis (CRC),
MinesParis Tech, Sophia Antipolis, France
Simon Maskell, Professor, University of Liverpool, United Kingdom
Cecilia Zanni-Merk, Professor, INSA Rouen Normandie, France

Abstract:

This research project outlines some methods and tools that I have developed during the last ten years and the perspectives of my scientific activities for the near future. The goal of those activities was to integrate knowledge into various processing chains implemented for defence and security applications. My contributions focused on several aspects. First, assessing the quality of information provided by humans, for which two main approaches were developed relying on either the semantics of ontologies to detect inconsistency and contradictions or on the properties of sources in the reporting chain to assign a degree of trust for every information item. Second, we have investigated the use of semantics as a backbone for information retrieval, reuse of experiences, and data fusion in heterogeneous and dynamic environments. We developed approaches that contribute to the overcoming problem of dynamically integrating resources, user feed-back, sensor data and observations, which is a critical aspect of situation awareness today. Third, we addressed the exploitation of open sources and social data in the context of defence and security applications. Those approaches have been developed in collaboration with several fellow researchers and include contributions from several master thesis and post docs. The work was carried out in the framework of two research projects that I coordinated and several research projects to which I contributed, with funding from the European Commission, ANR and CNRS. The projects involved academic and industrial partners, such as: George Mason University (USA), DRDC (Canada), FKIE (Germany), NATO CMRE (Italy), University Paris Nanterre, University Toulouse II (France), Thales TNO (Netherlands) and Airbus D&S (France).

Keywords:

Semantic frameworks, ontology, high-level information fusion, situation awareness, defence and security