# Editorial

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According to Endsley (1995), situation awareness is "the perception of elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future". Endsley's definition is surely complete, and in fact the huge umbrella of situation awareness spans comprehension, data fusion, reasoning, decision and dynamic reaction to changing conditions.

But a more immediate definition is "knowing what is going on so you can figure out what to do" (Adam, 1993). The key aspect of situation awareness is the ability to move form streams of raw data to complex aggregate information about the environment, the threats, the behaviour of agents – whether human or not – that may affect the scenario of interest.

This special issue of the journal stems from work generated in the 2012 International Defense and Homeland Security Simulation Workshop, held in Wien, Austria on 19–21 September 2012. During the conference, the relation between situation awareness and homeland security emerged clearly: situation awareness is a fundamental tool and pre-requisite for any effective protection strategy in several contexts, including national security, border surveillance, critical infrastructures, etc.

This relationship is becoming largely recognised worldwide. For instance, recently the US Department of Homeland Security (DHS) announced the Continuous Diagnostics and Mitigation (CDM) Programme (*Continuous Diagnostics and Mitigation*, http://www.dhs.gov/cdm), a contract award aimed at raising the protection with respect to cyber attacks by creating synergies with other government agencies. The idea is to generate agency-level dashboards based on the software, sensors and data assets and put the results together resulting in a federal-level dashboard, managed by DHS. Another recent example in this sense is the announced creation of a European Space Surveillance and tracking (SST) network, with the aim to obtain a shared system for space debris and satellite identification, thus improving the collision detection capabilities as well as preventing security issues (*Space Surveillance and Tracking – SST Segment*, http://www.esa.int/Our_Activities/Operations/Space_Situational_Awareness/Space_Surveillance_and_Tracking_-_SST_Segment).

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While governments are posing more and more effort on integrated situation awareness solutions, there are still several issue to be addressed and there is the need to provide adequate methodologies and frameworks, considering also the particular issues raised by the different fields of application, such as critical infrastructures or coastal surveillance.

This special issues intends to contribute in this sense, and several specific themes are addressed, such as homeland security, cyber attacks, coastal surveillance and human behaviour.

In their paper 'Homeland situation awareness through mining and fusing heterogeneous information from intelligence databases and field sensors', Digioia and Panzieri provide a data mining architecture aimed at discovering clusters of information and relations among data stored in different databases.

Foglietta et al., in their work 'Detection and impact of cyber attacks in a critical infrastructures scenario: the CockpitCI approach", define an online alerting system for preventing cyber attacks to critical infrastructures.

De Cillis et al. provide a methodology for the optimal placement of control facilities in an urban areas with the aim to improve security when large events or critical situations take place; this approach is discussed in their paper 'Optimal location of flow intercepting facilities to improve security in urban areas'.

In their work 'An interoperable simulation framework for protecting port as critical infrastructures', Bruzzone et al. resort to a simulated environment intended to analyse and investigate security issues in complex maritime scenarios affected by asymmetric threats (i.e., terrorist attacks).

A complementary issue is addressed by Balestrieri et al., in the paper 'Path planning for marine fleet using heuristic approach', where the authors consider an optimal algorithm for the route planning problem of a fleet of unmanned marine vehicles that have the duty to patrol the coasts.

Miciolino et al., in their work 'Distributed opinion dynamics with heterogeneous reputation', provide a distributed extension of the Hegelsmann-Krause opinion dynamics model that represents an agreement process among a set of agents, each characterised by a reputation value and constrained by a network topology.

Casola et al., in their paper 'SeNsiM-SEC: secure sensor networks integration to monitor rail freight transport', provide a monitoring system architecture based on wireless sensor networks to monitor a freight train transporting hazardous materials.

Amato et al., in their work 'A smart decision support systems based on a fast classifier and a semantic post reasoner', propose an innovative approach for smart event detection and enriched phenomena comprehension based on ontological and semantic models.

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Management of Terrorism and other Security-related Risk Programme, under Grant HOME/2011/CIPS/AG/2115 – FACIES online identification of Failure and Attack on Interdependent Critical Infrastructures (http://facies.dia.uniroma3.it). This publication reflects the views only of the authors, and the European Commission cannot be held responsible for any use which may be made of the information contained therein.

## References

Adam, E.C. (1993) 'Fighter cockpits of the future', *Proceedings of 12th IEEE/AIAA Digital Avionics Systems Conference (DASC)*, pp.318–323.

*Continuous Diagnostics and Mitigation*, US Department of Homeland Security [online] http://www.dhs.gov/cdm (accessed 10 September 2013).

Endsley, M.R. (1995) 'Toward a theory of situation awareness in dynamic systems', *Human Factors*, Vol. 37, No. 1, pp.32–64.

*Space Surveillance and Tracking – SST Segment* [online] http://www.esa.int/Our_Activities/Operations/Space_Situational_Awareness/Space_Surveillance_and_Tracking_-_SST_Segment (accessed 10 July 2013).