Editorial

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Biographical notes: Canicious Abeynayake is a Research Scientist in the Defence Science and Technology Organisation Edinburgh Australia. He has published key papers in the area human and system security. His interests include the applications of conventional and intelligent techniques in security and civilian applications.

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In this special issue, extended papers from the International Conference on Knowledge-Based and Intelligent Information & Engineering Systems (KES2008) conference are presented. The papers describe models and techniques within the computational intelligence area for processing data, handling information, as well as reasoning with knowledge. The results are applicable to information processing, knowledge management, and decision support in defence, security, and related domains. A summary of each paper is as follows.

Developing a usable knowledge-based system involves is a multi-faceted study, e.g., acquiring the domain knowledge, designing the user interface, changing the functionality, and modifying the reasoning strategy. In the first paper, a user-centred knowledge model known as t-UCK for modelling knowledge and supporting different users, from domain experts, engineers (or design users), to end-users, is presented. The model is useful to capture knowledge from users without having them to have insight in knowledge representation. An example in counter air mission planning is presented. Various examples that are useful for decision-making in counter air war scenarios are described.

Static and dynamic logics have been used to describe information states, actions, and events of agents. In the second paper, a hybrid logic of Logic of Plausibility for Discovery (LPD) that combines knowledge, time, discovery and plausibility operations in a multi-agent environment is described. A semantical model, based on Kripke/Hintikka, is devised. Rules for computing truth values of formulae are formulated. An algorithm to show that LPD is decidable by satisfiability is also presented. The suggested approach has potential to deal with a variety of logics and is useful for information processing and decision making.

Advances in information networks have enabled sharing of geographic data such as map information, sensor network data, and satellite images, in an easy way. However, it is difficult to apply the traditional models to handle events in a distributed environment. In the third paper, a three-layered model for sharing of event data in a distributed environment is proposed. By using the proposed model, event data and geographic objects can be represented independently, and shared among several application systems in the distributed environment. Application of the proposed model in Geographic Information Systems (GIS) is demonstrated.

In today's information age, one of the main challenges is to maintain security while routing the information from one source to another. In the last paper, methods to transmit, monitor, and process information within and beyond an organisation by using a

multi-agent system are described. The purpose of the work is to secure, control, and monitor end-to-end information flow. The results indicate that the multi-agent system, integrated with a general system theory approach, is able to increase control and efficiency, support distributed intelligent decision making with the goal to prevent sensitive information from being disclosed, modified, or lost.

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