
Editorial

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Biographical notes: Ariën J. van der Wal has been a Full Professor of Physics since 1986, teaching physics, electronics, and data analysis at the Universities of Eindhoven and Twente in The Netherlands. Currently, he holds the position of Associate Professor, teaching signal analysis and AI at the NLDA, located in Den Helder, the base of the Royal Netherlands Navy. His research interests include fast data acquisition, multiprocessing, distributed computing, factory automation, neural networks, evolutionary computation, fuzzy logic, radar, sensor fusion, and real-time soft-control.

It is with great pleasure that I have edited the present special issue of the *International Journal of Intelligent Defence Support Systems* with focus on the research activities of the NLDA, The Netherlands Defence Academy, and especially in the Faculty of Military Sciences (FMS). The FMS has a unique role within the Dutch academic community: it is the only academic institution facilitating scientific research and teaching in a military context.

The primary mission of the NLDA, more specifically of the FMS, is to provide the scientific education of future military officers of army, navy and air force in the context of a Bachelor-Masters programme. The FMS carries out independent research in defence-related fields, to keep up with actual scientific developments and is a 'think tank' for the Dutch Ministry of Defence. Furthermore, research supports the academic level of teaching. The research at the FMS is organised around three themes, viz. War Studies, Military Management Sciences and Military Technical Studies.

The present issue is a reflection of the scientific capabilities of the NLDA, and presents a cross-section of the current research interests, especially in the domain of military technology. In recent years, the political context of conflicts has drastically changed, as reflected by the fact that warfare is sometimes even euphemised as peacekeeping. For this reason, the character of military warfare has changed too, e.g. modern conflicts are more complex and more localised, in more difficult environments, and increasingly reliant on technology. The papers in this issue are aimed at users, developers and researchers alike. For the purposes of the *IJIDSS* support systems include all systems except the platform itself. Such intelligent systems span a wide range of socio-technical systems, ranging from human-in-the-loop C2 systems to optimisation schemes using intelligent agents. Many applications in the domains of artificial intelligence, computing with words, uncertainty modelling, and real-time pattern recognition are all subjects that have already been studied for more than three decades both in academia and in the military. However, despite the enormous efforts spent, they are far from being solved in a generic way.

The contributions in this issue span a wide domain, ranging from C2 to sensor allocation.

The first paper by Davids, Beeres and Grant discusses the modern role of command and control, and specifically that of the management of information. The classical approach to C2 is contrasted with the actual demands posed upon information in real situations, such as the NATO mission in Afghanistan. The study concludes that the concept of information management needs to be redefined. Management tools for performance management from the private sector may indicate novel ways towards a viable C2 infrastructure.

Although the days of the Cold War are long past, ballistic missiles carrying explosive or NBC warheads still present a very real local threat in crisis areas. Models for a robust defence strategy against these threats are therefore the object of active research in military operations analysis. In the second contribution by Bloemen, Evers, Barros, Monsuur, and Wagelmans both exact and heuristic methods are used to estimate the robustness of different missile defence location schemes in which the trade-off between the number of interceptor systems is balanced against the desired defence level.

In the third paper, Lefter, Rothkrantz, van Leeuwen, and Wiggers discuss how automatic detection of emotion in voices can help operators of 911-type lines to recognise the urgency of the call and thus make a triage. Combining several classifiers via an information fusion scheme yields more confidence, although the ideal overall scheme is still a matter for research. This research also has clear implications for the military domain, e.g. in communicating with combat groups or in the detection of fatigue with fighter pilots.

Koene and Papy review in the fourth contribution the experimental techniques needed to evaluate the performance of non-lethal weapons. They argue that more research into tissue stimulants is necessary if one wants to accurately model the effects of non-lethal projectiles.

Finally, Ramdaras, Absil and van Genderen look at a resource allocation problem: the problem of target tracking with multiple radar sensors on multiple platforms. In their approach, the selection of the correct sensors for optimal target tracking is achieved by solving a modified Ricatti equation.