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Jan Hodicky (Ed.)

Modelling and Simulation for Autonomous Systems

First International Workshop, MESAS 2014
Rome, Italy, May 5-6, 2014
Revised Selected Papers

Volume Editor

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ISSN 0302-9743

e-ISSN 1611-3349

ISBN 978-3-319-13822-0

e-ISBN 978-3-319-13823-7

DOI 10.1007/978-3-319-13823-7

Springer Cham Heidelberg New York Dordrecht London

Library of Congress Control Number: 2014955627

LNCS Sublibrary: SL 3 – Information Systems and Application, incl. Internet/Web and HCI

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Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

This volume contains the papers presented at MESAS Workshop 2014: Modelling and Simulation for Autonomous Systems held on May 5–6, 2014 in Rome.

MESAS 2014 was a two-day workshop organized by the NATO Modelling and Simulation Centre of Excellence. The event gathered together, in plenary sessions and round tables, fully recognized experts from different technical communities in military, academia and industry. The aim of MESAS 2014 was to explore the possible use of Modelling and Simulation to integrate systems with autonomous capabilities into operational scenarios and to support coalition interoperability.

The community of interest submitted 50 papers for consideration. Each submission was reviewed by 3 Program Committee members. The committee decided to accept 46 papers to be presented during the workshop. The plenary session and round table discussions included an extra 5 invited presentations. Following a thorough review process, only 32 papers were recommended to be included into these proceedings.

September 2014

Jan Hodicky



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Inter-Domain and Multi-disciplinary Exchange of Knowledge within Modelling & Simulation and Robotics Communities of Interest

The Idea

At the beginning of 2012, Supreme Allied Command Transformation invited all Centres Of Excellence (COE) to explore their possible involvement for the integration of Autonomous Systems in the operational activities. In response to this request, the M&S COE became actively involved in a Study Group within the System Analysis and Study Panel of the NATO Science & Technology Organization entitled SAS 097: “Robotics Underpinning Future NATO Operations”. Moreover, the M&S COE contributed to the Multinational Capability Development Campaigns (MCDC) 2013 and 2014 by participating to the Autonomous Systems (AxS) Focus Area meetings under the lead of ACT.

During ITEC 2013 in ROME, the Centre presented the information collected through SAS-097 and MCDC involvement. An example of the interaction between a simulated environment and a real robot was illustrated in what we called “a hybrid world” in which real and virtual robots cooperated to accomplish basic tasks.

In order to investigate further examples of how M&S can be applied to better integrate AxS into operational environments, the idea of MESAS was born: that is to create a Community of Interest focused on M&S in support of Autonomous Systems. The idea was further developed when we considered impacts to training, command and control interfaces and future AxS development.

The planning, organization and conduct of this workshop fit perfectly into the mission of the M&S COE, which provides support to NATO and Nations through collaboration with industry, academia and other organizations for research and experimentation of M&S tools and concepts.

The Way Ahead

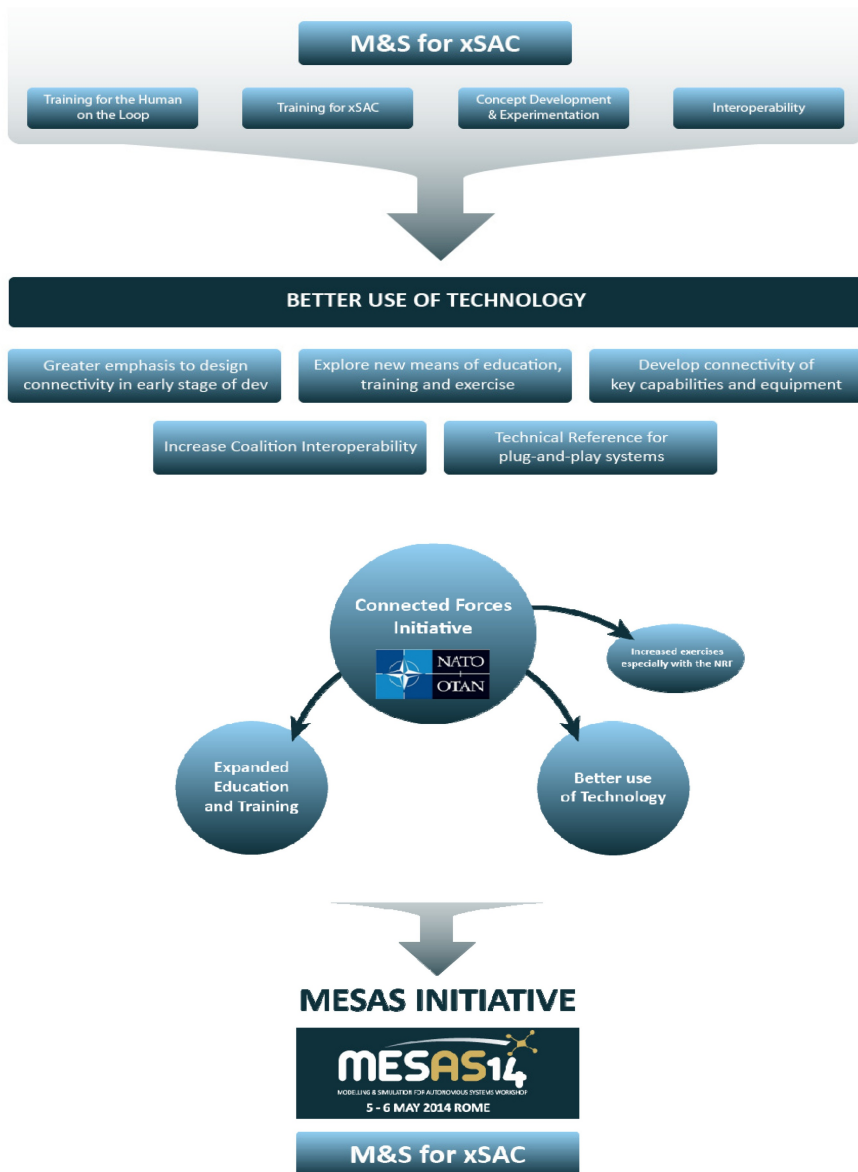
The future of integration and interoperability is reliant upon the exchange of ideas, visions and fresh perspectives, as well as experience, know-how and frank and open dialogue amongst all stakeholders.

I think this workshop has proven to be a significant opportunity for high level debate on the topics I mentioned above and I believe this newly established Community of Interest will continue to enhance future M&S/AxS development.

NATO M&S COE Director
Col. Stefano Nicoló

MESAS 2014 Objective

Systems with Autonomous Capabilities are abbreviated with the acronym xSAC, where the x indicates the operational domain: ground, maritime, air, space and cyber.



MESAS 2014 Organizer

NATO MODELLING AND SIMULATION CENTRE OF EXCELLENCE (NATO M&S COE)

The NATO M&S COE is a recognized international military organization activated by the North Atlantic Council in 2012, and is not under the NATO Command Structure. Partnering Nations provide funding and personnel for the Centre through a memorandum of understanding. Czech Republic, Italy and the United States are current members, but other nations are in consideration.

The NATO M&S COE supports NATO Transformation by improving the networking of NATO and nationally owned M&S systems, promoting cooperation between Nations and organizations through the sharing of M&S information and serving as an international source of expertise.

The NATO M&S COE seeks to be a leading world class organization, providing the best military expertise in modelling and simulation technology, methodologies and the development of M&S professionals. It will be the focal point of an integrated network of M&S training centres and other COEs promoting an interoperable, distributed M&S Service to all of NATO and Partnering Nations.

Key Objectives:

- Within 5 years, the NATO M&S COE will provide NATO and Nations a M&S framework composed of a Distributed Simulation Environment and Subject Matter Experts in M&S for Concept Development and Experimentation.
- Beyond 5 years, the NATO M&S COE will provide a persistent, distributed M&S framework among COEs, Nations, NATO training entities (JFTC, JWC) and key industry players, becoming the premier influential entity in M&S standardization.

NATO M&S COE with its M&S framework will become the glue for interdisciplinary military projects.



<https://www.mscoe.org/>

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