

# Contents

## Human Machine Integration, Interaction and Interfaces

Challenges in Representing Human-Robot Teams in Combat Simulations. . . .	3
<i>Curtis Blais</i>	
Data, Speed, and Know-How: Ethical and Philosophical Issues in Human-Autonomous Systems Cooperation in Military Contexts . . . . .	17
<i>Mark Coeckelbergh and Michael Funk</i>	
Human-Machine Interface for Multi-agent Systems Management Using the Descriptor Function Framework . . . . .	25
<i>Giovanni Franzini, Stefano Aringhieri, Tommaso Fabbri, Matteo Razzanelli, Lorenzo Pollini, and Mario Innocenti</i>	
Autonomous Systems Operationalization Gaps Overcome by Modelling and Simulation . . . . .	40
<i>Jan Hodicky</i>	
To Explore or to Exploit? Learning Humans' Behaviour to Maximize Interactions with Them . . . . .	48
<i>Miroslav Kulich, Tomáš Krajník, Libor Přeučil, and Tom Duckett</i>	
A Visual-Haptic Display for Human and Autonomous Systems Integration. . .	64
<i>Matteo Razzanelli, Stefano Aringhieri, Giovanni Franzini, Giulio Avanzini, Fabrizio Giulietti, Mario Innocenti, and Lorenzo Pollini</i>	
Modelling Visual Communication with UAS . . . . .	81
<i>Alexander Schelle and Peter Stütz</i>	

## Autonomous Systems and MS Frameworks and Architectures

Using AUTOSAR High-Level Specifications for the Synthesis of Security Components in Automotive Systems . . . . .	101
<i>Cinzia Bernardeschi, Gabriele Del Vigna, Marco Di Natale, Gianluca Dini, and Dario Varano</i>	
Modelling & Simulation Architecture Supporting NATO Counter Unmanned Autonomous System Concept Development . . . . .	118
<i>Marco Biagini and Fabio Corona</i>	

HLA Interoperability for ROS-Based Autonomous Systems . . . . .	128
<i>Arnau Carrera, Alberto Tremori, Pilar Caamaño, Robert Been, Diego Crespo Pereira, and Agostino G. Bruzzone</i>	
APRICOT: Aerospace PRototypIng Control Toolbox. A Modeling and Simulation Environment for Aircraft Control Design . . . . .	139
<i>Andrea Ferrarelli, Danilo Caporale, Alessandro Settimi, and Lucia Pallottino</i>	
Human Driven Robot Grasping: An Interactive Framework . . . . .	158
<i>Hamal Marino, Alessandro Settimi, and Marco Gabiccini</i>	
The Unmanned Autonomous Systems Cyberspace Arena (UCA). A M&S Architecture and Relevant Tools for Security Issues Analysis of Autonomous System Networks . . . . .	168
<i>Marco Biagini, Sonia Forconi, Fabio Corona, Agatino Mursia, Lucio Ganga, and Ferdinando Battiatì</i>	
NoStop: An Open Source Framework for Design and Test of Coordination Protocol for Asymmetric Threats Protection in Marine Environment . . . . .	176
<i>Simone Nardi and Lucia Pallottino</i>	
<b>Autonomous Systems Principles and Algorithms</b>	
Advancement in Multi-body Physics Modeling for 3D Graphical Robot Simulators . . . . .	189
<i>Gianluca Bardaro, Luca Bascetta, Francesco Casella, and Matteo Matteucci</i>	
Robust Place Recognition with Combined Image Descriptors . . . . .	196
<i>Martin Dörfler and Libor Přeucil</i>	
Assessing the Potential of Autonomous Multi-agent Surveillance in Asset Protection from Underwater Threats . . . . .	204
<i>Tommaso Fabbri, Simone Nardi, Luca Isgró, Lucia Pallottino, and Andrea Caiti</i>	
Rendering of 3D Maps with Additional Information for Operator of a Coal Mine Mobile Robot. . . . .	214
<i>Tomáš Kot, Petr Novák, Jan Babjak, and Petr Olivka</i>	
Geographical Data and Algorithms Usable for Decision-Making Process . . . .	226
<i>Dana Kristalova, Martin Vogel, Jan Mazal, Petra Dohnalova, Tomas Parik, Adam Macurak, and Katerina Fialova</i>	

Fusion of Monocular Visual-Inertial Measurements for Three Dimensional Pose Estimation . . . . .	242
<i>Gonzalo Perez-Paina, Claudio Paz, Miroslav Kulich, Martin Saska, and Gastón Araguás</i>	
Multi-agent Poli-RRT*: Optimal Constrained RRT-based Planning for Multiple Vehicles with Feedback Linearisable Dynamics. . . . .	261
<i>Matteo Ragaglia, Maria Prandini, and Luca Bascetta</i>	
STAM: A Framework for Spatio-Temporal Affordance Maps . . . . .	271
<i>Francesco Riccio, Roberto Capobianco, Marc Hanheide, and Daniele Nardi</i>	
Human-Like Path Planning in the Presence of Landmarks . . . . .	281
<i>Basak Sakcak, Luca Bascetta, and Gianni Ferretti</i>	
Indoor Real-Time Localisation for Multiple Autonomous Vehicles Fusing Vision, Odometry and IMU Data . . . . .	288
<i>Alessandro Faralli, Niko Giovannini, Simone Nardi, and Lucia Pallottino</i>	
<b>Unmanned Aerial Vehicles and Remotely Piloted Aircraft Systems</b>	
Disasters and Emergency Management in Chemical and Industrial Plants: Drones Simulation for Education and Training . . . . .	301
<i>Agostino Bruzzone, Francesco Longo, Marina Massei, Letizia Nicoletti, Matteo Agresta, Riccardo Di Matteo, Giovanni Luca Maglione, Giuseppina Murino, and Antonio Padovano</i>	
DeSIRE 2: Satcom Modeling and Simulation a Powerful Tool to Enable Cost Effective and Safe Approach to RPAS Operational Deployment . . . . .	309
<i>Giancarlo Cosenza, Alessandro Mura, Alessandro Righetto, Fabio De Piccoli, Dario Rapisardi, and Laura Anselmi</i>	
Modelling of the UAV Safety Manoeuvre for the Air Insertion Operations. . .	337
<i>Jan Mazal, Petr Stodola, Dalibor Procházka, Libor Kutěj, Radomír Ščůrek, and Josef Procházka</i>	
UAV as a Service: A Network Simulation Environment to Identify Performance and Security Issues for Commercial UAVs in a Coordinated, Cooperative Environment . . . . .	347
<i>Justin Yapp, Remzi Seker, and Radu Babiceanu</i>	
<b>Modelling and Simulation Application</b>	
Sniper Line-of Sight Calculations for Route Planning in Asymmetric Military Environments . . . . .	359
<i>Ove Kreison and Toomas Ruuben</i>	

The Design of 3D Laser Range Finder for Robot Navigation and Mapping in Industrial Environment with Point Clouds Preprocessing . . . . .	371
<i>Petr Olivka, Milan Mihola, Petr Novák, Tomáš Kot, and Ján Babjak</i>	
Accuracy of Robotic Elastic Object Manipulation as a Function of Material Properties . . . . .	384
<i>Vladimír Petřík, Vladimír Smutný, Pavel Krsek, and Václav Hlaváč</i>	
Tactical Decision Support System to Aid Commanders in Their Decision-Making. . . . .	396
<i>Petr Stodola and Jan Mazal</i>	
<b>Author Index . . . . .</b>	<b>407</b>

Modelling and Simulation for Autonomous Systems  
Third International Workshop, MESAS 2016, Rome, Italy,  
June 15-16, 2016, Revised Selected Papers  
Hodicky, J. (Ed.)  
2016, XVI, 408 p. 230 illus., Softcover  
ISBN: 978-3-319-47604-9