

PROCEEDINGS OF SPIE

Open Architecture/Open Business Model Net-Centric Systems and Defense Transformation 2022

Raja Suresh
Editor

3–7 April 2022
Orlando, Florida, United States

6–12 June 2022
ONLINE

Sponsored and Published by
SPIE

Volume 12119

Proceedings of SPIE 0277-786X, V. 12119

Open Architecture/Open Business Model Net-Centric Systems and Defense Transformation 2022,
edited by Raja Suresh, Proc. of SPIE Vol. 12119, 1211901
© 2022 SPIE · 0277-786X · doi: 10.1117/12.2643542

Proc. of SPIE Vol. 12119 1211901-1

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in *Open Architecture/Open Business Model Net-Centric Systems and Defense Transformation 2022*, edited by Raja Suresh, Proc. of SPIE 12119, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X
ISSN: 1996-756X (electronic)

ISBN: 9781510651142
ISBN: 9781510651159 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2022 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.org

Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

v *Conference Committee*

OPEN ARCHITECTURE SYSTEMS I

- 12119 02 **A system dynamics model for technology maturation and capability development within the US Dept. of Navy (Invited Paper)** [12119-1]
- 12119 03 **An open architecture approach for a software defined radio waveform development challenge** [12119-3]
- 12119 04 **Escaping the vendor event horizon using the SOSA technical standard** [12119-4]

OPEN ARCHITECTURE SYSTEMS II

- 12119 06 **Rapid RISC: fast customization of RISC-V processors** [12119-11]
- 12119 07 **Generation of MBSE models from system requirements** [12119-12]
- 12119 08 **Software defined networking emulator for network application testing** [12119-13]
- 12119 09 **High assurance state machine microprocessor concept: Aberdeen Architecture** [12119-7]

SELF-ORGANIZING, COLLABORATIVE, UNMANNED ROBOTICS TEAMS: JOINT SESSION WITH CONFERENCES 12119 AND 12124

- 12119 0A **Awareness, control, and trust in multi-agent hybrid dynamical systems** [12119-23]
- 12119 0B **Online deep learning for behavior prediction** [12119-24]
- 12119 0C **Distributed beamforming sonar for UUVs** [12119-25]

COMMAND, CONTROL, AND COMMUNICATIONS

- 12119 0D **DevSecOps for the transition of secure data sharing technology (Invited Paper)** [12119-14]

- 12119 0E **Lessons learned from designing a software defined radio for a small unmanned air vehicle**
[12119-15]
- 12119 0F **System simulation architecture and design for maritime surveillance with unmanned assets**
[12119-16]
- 12119 0G **An ISR asset planning application: software architecture and components** [12119-17]
- 12119 0H **A data-centric reinforcement learning approach for self-updating machine learning models**
[12119-18]
- 12119 0I **A multinational standard based approach for filtered information distribution in a mobile environment** [12119-19]
- 12119 0J **Cloud-based satellite constellation emulation environment for accelerated network, security, and payload interoperability testing** [12119-21]

Conference Committee

Symposium Chairs

Augustus W. Fountain III, University of South Carolina (United States)
Teresa L. Pace, L3Harris Technologies, Inc. (United States)

Program Track Chair

Tien Pham, CCDC Army Research Laboratory (United States)

Conference Chair

Raja Suresh, General Dynamics Mission Systems (United States)

Conference Program Committee

Joseph Borden, Teledyne Benthos (United States)
Emily A. Doucette, Air Force Research Laboratory (United States)
Patrick Jungwirth, U.S. Army Research, Development and Engineering
Command (United States)
Wilmuth Muller, Fraunhofer-Institut für Optronik, Systemtechnik und
Bildauswertung (Germany)
Hoa G. Nguyen, Office of Naval Research Global (Japan)
John Polson, General Dynamics Mission Systems (United States)
Jonathan D. Shaver, Air Force Research Laboratory (United States)
Jason R. Stack, Office of Naval Research (United States)

