

Foreword

Second Edition, Operations Research and Analysis (OR&A)

Dr. Ana Isabel Barros

Dutch Organization for Applied Scientific Research (TNO)

NETHERLANDS

ana.barros@tno.nl

We are pleased to bring you the third Operations Research and Analysis (OR&A) issue of the peer-reviewed *Journal of the NATO Science and Technology Organization*.

This special edition contains a selection of the papers that were presented at the NATO Science & Technology Organization (STO) Research Symposium titled 18th NATO OR&A Conference (STO-MP-SAS-192) held at the Residencia Militar Castañón de Mena, in Málaga, Spain, from 4 to 6 November 2024.

This event, overseen by the STO System Analysis and Studies (SAS) Panel, brought together 140 participants from the NATO OR&A community, representing NATO commands and agencies, national defence analysis and research organizations, centres of excellence, academia, and industry to discuss the conference theme “**Collaboration to enable military advantage in an unstable world.**” This theme highlighted NATO’s strength in its unity. Effective collaboration solves problems, builds trust and, ultimately, achieves defence objectives. Many contributions at the conference called attention to successful examples of OR&A collaboration among alliance members.

This special edition features a selection of the best publicly releasable full papers from the conference, which were peer-reviewed by leading international military OR&A experts. Other full papers, as well as all short papers that were presented at the conference, are published in NATO’s STO peer-reviewed conference proceedings.

This journal special issue includes three papers:

- In “Protecting Global Navigation Satellite Systems (GNSS) Critical Infrastructure in an Unstable World,” Francisco Gallardo López, Antonio Pérez Yuste and David Sánchez Heredero describe the increasing threat from GNSS spoofing and jamming, and two Artificial Intelligence based systems developed to detect and protect against such attacks.
- Next, in “An Approach to Estimate the Impact to Mission Functions Following a Cyber Breach,” Maxwell Dondo proposes a framework for cyber damage assessment based on the fuzzy logic aggregation of the measured losses resulting from a cyber breach. Understanding the consequences of a cyber breach on military mission functions is imperative to inform command decisions.
- Finally, in “Rapid Effectiveness Modelling for Artillery Munitions: Advance Interoperability and Technical Overmatch,” Evelyn Welling and Antonio Aguirre present a Monte Carlo modelling methodology for estimating munition effectiveness. Effectiveness appraisals from their approach can inform the rebuilding of stockpiles, expanded munition interchangeability, and future weapons technology improvements, while avoiding the cost-prohibitive development of high-fidelity models.

These three papers clearly demonstrate that OR&A continues to help NATO and the nations address important security challenges.

Managing Editor: Natalia Lorenzoni

Associate Editor: Dr. Ana Isabel Barros

Editorial Team: Dr. Etienne Vincent; Mrs Sue Collins