

## FOREWORD

This special issue of the Industrial and Systems Engineering Review highlights top papers from the 2020 Annual General Donald R. Keith memorial capstone conference held at the United States Military Academy in West Point, NY. The conference was certainly a first of its kind virtual conference including asynchronous delivery of paper presentations followed by synchronous question and answer sessions with evaluation panels. Following careful review of 63 total submissions, eleven were selected for publication in this journal. Unique to this year's special edition is the mixed selection of seven project team capstone papers, and four honors research papers. Each paper incorporated features of systems or industrial engineering and presented detailed and reflective analysis on the topic. Although there are many elements which cut across the works, three general bodies of knowledge emerged in the papers including: systems engineering and decision analysis, systems design, modeling and simulation, and system dynamics.

Systems Engineering and Decision Analysis topics included three unique contributions. Recognized as 'best paper' at the 2020 virtual conference, the work of Robinson et al. designed a multi-year predictive cost engineering model enabled through a MS O365 Power BI decision support interface to support U.S. Army Corps of Engineer (USACE) inland waterway national investment strategies. Schloo and Mittal's work presents research in testing and evaluation of the Engagement Skills Trainer (EST) 2000 towards improving real-world soldier performance. Gerlica et al. employs a robust and scalable K-means clustering methodology to improve decision making in defensive shift schemes for Air Force Baseball outfield personnel.

Systems Design works included three unique contributions. Binney et al. worked to design evaluation criteria for military occupational specialties associated with open-source intelligence (OSINT) analysts for the Army's OSINT Office. Hales et al. interdisciplinary work aided in the design of search and identification systems to be incorporated on autonomous robotics to enable survivability improvements for the Army's chemical, biological, radiological, nuclear, and explosives (CBRNE) units. Burke and Connell evaluated and designed a performance measurement-based assessment methodology for U.S. Pacific Command's Key Leader Engagement process.

System modeling and simulation included three unique contributions: Arderi et al. simulated and assessed how the Hyper-Enabled Operator (HEO) project improves situational awareness for U.S. Special Forces using the Infantry Warrior Simulation (IWARS). Blanks et al. employed a VBA module and Xpress software for a scheduling optimization model for enhancement of final exam scheduling at the U.S. Air Force Academy. Kelley and Mittal utilized a Batch Run Analysis and Simulation Studio (BRASS) program to batch multiple iterations of IWARS scenarios to study the integration of autonomous systems alongside military units.

Finally, two unique contributions utilizing system dynamics (SD) modeling are presented: Dixon and Krueger developed a Vensim SD model to examine how policy recommendations across Central America could restrict gang activities while positively promoting women's involvement in society. Cromer et al. utilized systems design approaches and a K-means clustering machine learning techniques to develop SD models in support of the U.S. Africa Command and Defense Threat Reduction Agency to examine the interdependence of threats across the Horn of Africa.

Thank you and congratulations to the 2020 undergraduate scholars and all authors who provided meaningful contributions through steadfast intellectual efforts in their fields of study! Well done!

LTC James H. Schreiner, PhD, PMP, CPEM  
Program Director, Systems and Decision Sciences (SDS)  
Department of Systems Engineering  
United States Military Academy  
Mahan Hall, Bldg 752, Room 423  
West Point, NY 10996, USA  
[james.schreiner@westpoint.edu](mailto:james.schreiner@westpoint.edu)