JOURNAL OF DEFENSE MODELING AND SIMULATION: APPLICATIONS, METHODOLOGY, TECHNOLOGY (JDMS)

Special Issue
Modeling and Simulation Technologies to Enhance and Optimize the DoD’s Medical Readiness and Response Capabilities

Introduction
Modeling and Simulation (M&S) technologies have long been used to assist in the testing and evaluation of systems, digitally, before their development takes place, and in the development of training systems to satisfy a range of performance needs.

While M&S tools have had considerable success in other domains, their application to medical challenges has been limited. The high operations tempo that the US Military has experienced over the past decade has placed significant demand on the military medical community, from the enlisted ‘medics’ who provide point of injury care to the officer-level nurses, physicians, surgeons, and physicians assistants. These growing demands are seen through increased training and certification requirements, deployment of more complex and sensitive diagnostic and treatment equipment, and the need to assimilate greater amounts of information at the patient care, as well as the strategic planning, level. While modeling and simulation could provide solutions to these challenges, precisely how M&S technologies could do so is still a matter of significant discussion. To help advance this conversation, this special issue of the Journal of Defense Modeling and Simulation is seeking research-based, theory-based, or policy-based manuscripts that focus on one or more of the following aspects of applying Modeling and Simulation tools to medical challenges:

Medical Training and Learning Technologies: Developing and maintaining skills among the personnel of the Military Health System is crucial. This includes both pre-deployment training, certification, and post deployment re-integration training, for both Enlisted and Officer-grade medical practitioners. Modeling and Simulation (M & S)-based training technologies, which include Advanced distributed learning, digital tutoring systems, and virtual reality, should enable health-care personnel to plan, respond, and manage the future medical missions, and should assist medical professionals to maintain clinical knowledge, skills, and certifications.
Health Surveillance and Planning Tools: The US Military continues to expand its efforts into non-kinetic operations to include Stabilization, Security, Transition, and Reconstruction Operations (SSTRO) and Humanitarian Aid / Disaster Relief Operations, while maintaining its traditional combat capabilities. The development and surveillance of the healthcare landscape of a region of interest forms a cornerstone of the strategy developed to support these actions. M & S tools can provide a significant increase in the ability to forecast potential medical risks in a given area, the impact on medical force readiness, and potential courses of action to mitigate significant, adverse consequences.

Healthcare Informatics and Decision Support Systems: The field of combat medicine is dynamic, changing in response to the evolving challenges to which our Warfighters are exposed. There is a critical need to optimize the acquisition, storage, retrieval, and use of healthcare related information for each patient to ensure consistent and timely care. Additionally, the increasingly large data sets that represent an individual patient’s health status coupled with the handoffs to different practitioners assisting in the treatment, requires M & S tools that facilitate rapid and accurate pattern classification and hypothesis testing.

Medical Technology Design Tools: Technology improvements combined with the growing range of US Military missions have led to increasingly complex medical technology requirements. The complexity of balancing platform performance against cost continues to challenge developers and acquisition decision-makers as they struggle to deliver improved performance against a backdrop of finite resources and increasing life-cycle costs. Yet, traditional approaches of design-build-test-redesign are too costly and time-consuming to support the short design cycles required. M & S technologies can provide a means for rapidly prototyping new technologies as they are designed. These technologies would also allow for integration with other types of models (e.g. materiel and environmental models) to predict their effects on a proposed medical technology design.

Total Ownership Cost-based Assessment Tools: Regardless of the M & S capability developed, the complexity of balancing system performance against cost continues to challenge developers and acquisition decision-makers as they struggle to deliver improved performance against a backdrop of finite resources and increasing life-cycle costs. M & S tools can help account for costs associated with a platform throughout its lifecycle, completing these valuations early in the lifecycle, while managing the risk associated with estimating certain cost and performance targets.

Submissions for Full Paper Review
For manuscript formatting and other guidelines, please visit the Author Guidelines for JDMS page. Manuscripts must not have been previously published or be submitted for publication elsewhere. Each submitted manuscript must include title, names, authors' affiliations, postal and e-mail addresses, and a list of keywords. For multiple author submission, please identify the corresponding author.

Papers submitted to this special issue should be original and must not be under review elsewhere. Papers will be peer-reviewed in the same manner as other submissions to The
Journal of Simulation. Papers must be submitted electronically via http://mc.manuscriptcentral.com/jdms. Please indicate in the cover letter that the paper is intended for this special issue. Further information can be found at the Society for Modeling and Simulation at http://www.scs.org.

**Important Dates**
Submission: November 30, 2015  
Revised Submissions Due: April 30, 2016  
Notification of Acceptance: July 31, 2016  
Submission of final (revised) papers: August 31, 2016  
Expected date of publication: Winter 2017

**Guest Editors**
- CDR Joseph Cohn, OASD (R&E), Human Performance Training and Biosystems
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