Modeling and Simulation Technology Center

Homeland Security
Science and Technology

S&T TECHNOLOGY CENTERS

The Department of Homeland Security (DHS) Science and Technology Directorate's (S&T) Technology Centers' conduct enduring and forward looking basic and applied research in cross-cutting scientific, engineering and technology areas to:

- Ensure advancements in science and technology are harnessed for cutting edge solutions to operational challenges; and
- Ensure technical subject matter expertise capabilities are available to S&T and the Department for decision making. S&T maintains the Technology Centers as a capability to identify and address current and future homeland security challenges.

MODELING AND SIMULATION TECHNOLOGY CENTER

The Modeling and Simulation Technology Center (MS-TC) provides strategic modeling and simulation guidance, tools and support to entities and programs within the Homeland Security Enterprise seeking to achieve performance management thresholds. These thresholds relate to applying new technologies and knowledge products for operational missions and environments.

CORE RESEARCH AND ACTIVITIES

MS-TC serves as a subject matter expert resource for rapid prototyping of tools to model and simulate operational, threat forecasting and incident response environments. In addition to providing expertise, MS-TC conducts core research in the following thrust areas to ensure DHS is able to take advantage of cutting edge modeling and simulation capabilities:

- *Immersive Visualization:* 3D immersive, augmented and virtual reality technologies for visualization and training.
- *Process Modeling and Gaming:* Agent-based simulations, "war-gaming" technologies and risk modeling.
- *Predictive Threat Modeling:* Predictive models using machine learning algorithms.

MC-TC also hosts a DHS Modeling and Simulation Community of Interest (ModSim COI) to promote awareness, cooperation reuse and interoperability of modeling and simulation tools Department- wide to improve capacity and provide potential cost savings. MS-TC monitors modeling and simulation use, trends, policies and advancements that span interagency, international, academia and industry in order to maintain awareness for the ModSim CoI.

PARTNERS

- Department of Defense, Modeling and Simulation Coordination Office (DMSCO) – Alexandria, VA
- Institute for Simulation and Training (IST) – Orlando, FL
- Uniformed Services, University of the Health Sciences (USUHS) Simulation Center – Bethesda, MD
- U.S. Army Corps of Engineers, Engineer Research and Development Center (ERDC) – Vicksburg, MS

IMPACTS, ACCOMPLISHMENTS AND SUCCESSES

Public Security for National Events

MS-TC, in partnership with the U.S. Secret Service, provided technical oversight of crowd ingress and egress, as well as emergency evaluation of crowd dynamics for the 2016 Republican and Democratic National Conventions and the 2017 Presidential Inauguration.

Force Training for DHS Federal Law Enforcement Training Center (FLETC)

MS-TC identified commercial modeling and simulation tools that would aid FLETC in training law enforcement officers on use of force and a variety of decision making factors (e.g., perceptual speed, fatigue, situational awareness and biometrics). Likewise, the solution platform transitions between lethal/less-lethal weapons and extends physical space by blending an immersive physical environment with a controlled simulated scenario.

Counter Small Unmanned Aerial Systems Advisory and Review Toolkit

MS-TC executed and operated the Counter Small UAS Advisory and Review Toolkit (C-SMART) as part of S&T's Unmanned Aerial Systems (UAS). C-SMART optimizes sensor layouts of Counter UAS systems for specific events and infrastructure, conducts forensics analysis of

MS-TC C-SMART execution in support of S&T's UAS program

engagements and enables stakeholders and decision makers to assess and improve the efficiency of security postures.