Times are listed as Eastern Standard Time (EST)
"Presentation Title to be Announced" will be updated when we have a Distribution A title.
* Indicates the presenter is a candidate for the Early Career Award

2022 National Fire Control Symposium
Monday, 14 February 2022

	Track One
1000 - 1005	**Welcome & Announcements**
1005 - 1050	**Keynote: Mr. Robert Shevock Jr., SES** Executive Director, Program Executive Office for Integrated Warfare Systems
1050 - 1100	**Lifetime Achievement Award**
Advanced Technologies	
1100 - 1105	**Session Introduction**
1105 - 1125	**Mapping Artificial Intelligence to the Kill Chain**
1125 - 1145	**Force-Level Hardkill / Softkill Assignment using Partially Observable Markov Decision Processes**
1145 - 1205	**Deploying Meta-Models in Warfighter Laptops to Drive "Real-Time," On-Site Course-of-Action Recommendations that Solve Complex Kill Chain Solutions**
1205 - 1225	**Break**
1225 - 1245	**Elastic Computing for Targeting**
1245 - 1305	**Photonics and Quantum Science for Future Fire Control**
1305 - 1325	**Hybrid Contextual Bayesian Reasoning Reduces High-Confidence False Alarms**
1325 - 1345	**Manufacturing of Polymer Gradient Index (GRIN) Lenses for Military Optics**
1345 - 1405	**Event-Verb-Event (EVE) Constructs to allow Machine Learned Systems to Solve Complex Kill Chain Problem**
Advanced Technologies *Rapid Fire Tech Highlight*	
1405 - 1420	**PIPEDREAM: COTS Surface to Air Missile**
1420 - 1440	**Break**
Space Systems	
1440 - 1445	**Session Introduction**
1445 - 1505	**Ultra-Wide Field-of-View Sensor Demonstration for Low Earth Orbit Applications**
1505 - 1525	***On-Orbit Dark Ship Target Recognition**
Joint Integrated Air & Missile Defense	
1525 - 1530	**Session Introduction**
1530 - 1550	**Defense Against Mass Raids: Two Geographical Case Studies**

1550 - 1610	**Demonstrating Tenets of an Integrated Combat System Force at U.S. INDOPACOM Valiant Shield 2020**		
Joint Integrated Air & Missile Defense *Rapid Fire Tech Highlight*			
1610 - 1625	**Chance Favors the Prepared Mind: Digital Tools for Capability Portfolio Management**		
1625 - 1630	**Transition to Networking Social**		
1630 - 1730	**Networking Social on Remo**		
Tuesday, 15 February 2022			
	Track One		
1000 - 1005	**Welcome & Announcements**		
1005 - 1050	**Keynote: Brigadier General John M. Olson, PhD** Mobilization Assistant to the Chief of Space Operations, Headquarters United States Space Force and the Chief Data and Artificial Intelligence Officer for the Department of the Air Force		
1050 - 1055	**Transition to Parallel Sessions**		
Track One		**Track Two**	
Fire Control Platform Capabilities		**Directed Energy**	
1055 - 1100	**Session Introduction**	**1055 - 1100**	**Session Introduction**
1100 - 1120	***Applications of IRST Algorithms for Long-Range Target Detection**	**1100 - 1120**	**MIRORS – A Multispectral EO/IR Toolkit of HEL for Object Detection and Identification**
1120 - 1140	***Advanced Lethality - Kinetic Energy (AL-KE)**	**1120 - 1140**	**High Energy Laser with Integrated Optical-Dazzler and Surveillance: A Case Study in Evolving Laser – Combat System Integration**
1140 - 1200	**Multiple Asset Allocation System Technologies for E-2D with Real-time Measurement of Integration for Naval Deployment (MA2STERMIND)**		
1140/1200 - 1220	**Break**		
Unmanned & Autonomous Systems (Sensors, Weapons & Platforms, including Counter UAS)		**Electronic Warfare**	
1220 - 1225	**Session Introduction**	**1220 - 1225**	**Session Introduction**
1225 - 1245	***Soldier Portable Anti-Aerial Attack Remotely Operated Weapon System**	**1225 - 1245**	**Defeating RF Cognitive Sensors**
1245 - 1305	***Next Generation Airborne Early Warning Approach**	**1245 - 1305**	***M&S Frameworks to Evaluate Cognitive Algorithm Performance for Enhanced IFC Preparation and Configuration**
1305 - 1345	**Swarm Research Experiments with Applications in Fire Control**	**1305 - 1325**	***Passive Target Tracking Under GPS Denial**

		1325 - 1345	Aether Spy – Bringing a Digital Array to the Battle Space
1345 - 1405	*UAS Kinetic Threat Defeat using Multi-Mode Armament System	1345 - 1405	Developing Decision-Support Systems through Collaborative R&D
Unmanned & Autonomous Systems (Sensors, Weapons & Platforms, including Counter UAS) *Rapid Fire Tech Highlight*		1405 - 1425	*Generating Realistic RF Test Data Through Style Transfer
1405 - 1420	Distributed Effects Chains in the Age of Autonomous Warfare and Unmanned Systems		
1420/1425 - 1440	Break		
Rapid Transition of New Technology to the Warfighter		Multi-Domain Command & Control & Intelligence, Surveillance & Reconnaissance	
1440 - 1445	Session Introduction	1440 - 1445	Session Introduction
1445 - 1505	Advanced Object Classification for UHF Radars in Missile Defense	1445 - 1505	RF Flare Systems Analysis
1505 - 1525	A Software defined Arbitrary Waveform Generator (SAWG) Model for a Multi-Mode Radar System	1505 - 1525	Rapid Expeditionary Persistent Autonomous Coastal Surveillance (REPACS)
1525 - 1545	*Common Display Architecture	1525 - 1545	Project Hypatia
1545 - 1605	*Hypersonic Vehicles with Robust and Adaptive Control	1545 - 1605	*Combined Radar Sensing and Networked Fire Control
1605 - 1625	Fourteen Tips to Increase Confidence in the Performance of Artificial Intelligence (AI)/Machine Learning (ML) Functions during the Five Stages of Development	Multi-Domain Command & Control & Intelligence, Surveillance & Reconnaissance *Rapid Fire Tech*	
		1605 - 1620	Sonar EMILY Redefining Search and Rescue (SAR)
1625 - 1630	Transition to Networking Social		
1630 - 1730	Networking Social on Remo: Hosted by Raytheon Technologies		
Wednesday, 16 February 2022			
	Track One		
1000 - 1005	Welcome & Announcements		
1005 - 1050	Keynote: Dr. Bill Melvin Deputy Director for Research & Director of the Sensors and Intelligent Systems Directorate, Georgia Tech Research Institute		
1050 - 1055	Transition to Parallel Sessions		

Track One		Track Two	
Mission Planning & Battle Management for Integrated Fire Control		**Sensor Resource Management/Sensor & Data Fusion**	
1055 - 1100	Session Introduction	1055 - 1100	Session Introduction
1100 - 1120	Battle Readiness Engagement Management (BREM) Prototype: A Wargaming Tool to Analyze "Realistic" Complex Kill Chains	1100 - 1120	*Angle Only Tracking with Reduced State Estimators; Single and Multi-Sensor Performance
		Sensor Resource Management/Sensor & Data Fusion ***Rapid Fire Tech Highlight***	
1120 - 1140	*CPU and Memory-Driven Real-Time Battle Management Configuration	1120 - 1135	MAGIC: Multi-Modal Fusion for Real-Time Target Detection
1140 - 1200	Progress on an Advanced Mission Planner (AMP) for Integrated Air and Missile Defense – Toward Defeating Coordinated Raids	1135 - 1150	Radar Resource Management During Raid Operation
		Networked & Distributed Warfare	
Mission Planning & Battle Management for Integrated Fire Control ***Rapid Fire Tech Highlight***		1150 - 1155	Session Introduction
1200 - 1215	High Value Airborne Asset Survivability	1155 - 1215	*Directed Energy (DE) Sensor Quality of Service (QoS) Requirements
Combat ID			
1215 - 1220	Session Introduction	1215 - 1235	Integrated Combat System Architecture to Support Distributed Maritime Operations
1220 - 1240	*Non-Cooperative Combat Identification in AFRL/RY		
1235/1240 - 1300	Break		
1300 - 1320	*Explainable Deep Learning based on Wavelet Transforms for Target Identification	1300 - 1320	Differential Relationships: A Track-Based Engagement Broker
1320 - 1340	Chicken Little Sensor Week 2022	1320 - 1340	Elektra Architecture and Impacts on the Future Naval Force Protection
1340 - 1400	Air to Surface Combat ID - Are These the Droids We're Looking For?	1340 - 1400	Securing the Kill Chain from Cyber Attacks
1400 - 1420	*Machine Learning Multi-Look SAR Classification	**Application of Autonomy in Fire Control Systems**	
		1400 - 1405	Session Introduction

		1405 - 1425	Addition of Depth of Fire Considerations in Engagement Coordination
1420 - 1440	Joint Multi-Platform Advanced Combat ID (JMAC)	1425 - 1445	Evaluating and Improving the Robustness of DoD Machine Learning Systems
1440/1445 - 1500	Break		
1500 - 1520	Multi-Modality, Hybrid Machine Learning and Model-Based ATR for Real-Time Target Identification	1500 - 1520	Evaluation of Threat Level using Artificial Intelligence
1520 - 1540	Harnessing Artificial Intelligence to Develop and Evaluate Systems: Assessing Real-World Robustness	1520 - 1540	*Scalable Engagement Planning Framework for Missile Defense
Combat ID *Rapid Fire Tech Highlight*		Application of Autonomy in Fire Control Systems *Rapid Fire Tech Highlight*	
1540 - 1555	Temporally-Multiplexed Raman-Waveform Spectropolarimetric LiDAR for Target ID	1540 - 1555	Speed of Battle: Acceleration of Sensor to Shooter
1555-1600	Transition to Networking Social		
1600 - 1700	Networking Social on Remo: Hosted by The Boeing Company		

Thursday, 17 February 2022

	Track One
1000 - 1005	Welcome & Announcements
	Advisory Committee Recognition for Outgoing Members
1005 - 1050	Keynote: VADM Jon Hill Director, Missile Defense Agency
1050 - 1055	Transition to Parallel Sessions

Track One		Track Two	
Combat ID		Live, Virtual, & Constructive Modeling & Simulation, Training & Wargaming	
1055 - 1100	Session Introduction	1055 - 1100	Session Introduction
1100 - 1120	*Development and Application of a Neighborhood-Based Classifier for Object Identification	1100 - 1120	European Test Bed: Adding Air to the Missile Defense Test Bed
1120 - 1140	*Development and Application of Alpha Shapes for Trustworthy Classifier Outputs	1120 - 1140	The Strategic Decomposition Method: Lessons from the Battle of Britain
1140 - 1200	Providing Earlier and More Robust Discrimination Results by Merging Multiple Sources	1140 - 1200	*Partially Observable Markov Decision Process (POMDP) for Generating Warfighter Figures of Merit

1200 - 1220	*Bad Pulse Mitigation Algorithm for Radar Frequency Jump Burst Processing	1200 - 1220	*Joint Cognitive Operational Research Environment Integration Framework for Information Exchanges (JIFFIE)
1220 - 1240	Break		
Combat ID, continued		Weapons, Munitions & Engagement Alternatives	
1240 - 1245	Announcements	1240 - 1245	Session Introduction
1245 - 1305	*Application of Neural Networks in the Signal Processor	1245 - 1325	SkyView Navigation System
1305 - 1325	DRFM Efforts for CID		
1325 - 1345	*Interpretable Machine Learning for Detection and Identification	1325 - 1345	Assessment of Closed-Loop Fire Control Technologies
1345 - 1405	Joint Multi-Platform Advanced Combat Identification (JMAC) Integration and Evaluation	1345 - 1405	A Guidance Methodology for Ship-Self Defense
1405 - 1425	Break		
Combat ID, continued		Hypersonics/Conventional Prompt Strike & Hypersonic Threat Defense	
1425 - 1430	Announcements	1425 - 1430	Session Introduction
1430 - 1450	*Generative Adversarial Network for Effective Data Augmentation	1430 - 1450	Development of an Automated Hypersonic Aerodynamic Analysis & Optimization Framework
1450 - 1510	Open Set Vibrometry AiTR Based on Confidence Metrics	1450 - 1510	Hypervelocity Gun Weapon System Engagement of Surrogate Cruise
Special Topic		1510 - 1530	Review of Hypervelocity Projectile Aerothermal Development
1510 - 1610	A Vision for the Integrated Warfighting Network	1530 - 1550	AI/ML for the Generation of HGV Targeting Probabilities
		1550 - 1610	Rapid Optimization of Trajectories for Hypersonics
1610 - 1615	Transition to Networking Social		
1615 - 1715	Networking Social on Remo *Early Career Winners to be Announced*		