T & E in a Multi-domain Operational Environment

13-July   First Day – Tutorials

8:00 a.m. – 12:00 p.m.   Morning Tutorials

Introduction to Cybersecurity Test and Evaluation
Pete Christensen, American Systems

This tutorial will familiarize attendees with Cybersecurity and Test and Evaluation as it applies to US Federal Government Programs and the U.S DOD. Note that the ideas and concepts presented also apply in principal to any acquisition program. Topics that will be addressed include Cyberspace as an operational domain, Cybersecurity threats, malware, DHS and DOD systems acquisition and associated Cyber T&E policy and process including "Cloud" Programs, requirements analysis, evaluation frameworks, cyber tabletop exercises, cooperative vulnerability assessments, adversarial assessments, cyber ranges and lessons learned.

Predicting & Validating Prototype Performance
Mark Kiemele, PhD, Air Academy Associates

Design of Experiments (DOE) is a method that can and should be used not only in the design and development of systems, but also in the modeling and validation of prototype systems **such as JADC2 systems**. Building useful prediction models and then validating them can ease the burden of making procurement decisions. This tutorial will examine two prototypes that are built to satisfy a common set of requirements. DOE will be used to model the performance of each prototype. Then validation testing will be used to confirm the models and assess the performance capability of each prototype, i.e., how well the prototypes meet the requirements. This facilitates a comparison of the capabilities of the two systems, thereby enhancing the decision as to which system to pursue. There are no prerequisites for this tutorial, as the analysis will be demonstrated via computer. Intended Audience: This tutorial is for anyone interested in learning how to model performance and evaluate the capability of multiple prototypes, which should include managers, scientists and engineers and those having to make procurement decisions, would benefit from this course. There are no specific education requirements required, though some knowledge of algebra and basic statistics would help.

Video Compression
Gary Thom, Delta Information Systems

With the growing complexity of flight test programs and the improved efficiency of compression algorithms, video is an ever increasing component of flight test data collection. This tutorial will provide a basic understanding of video interfaces. This will include a discussion of the signals, formats, resolutions and frame rates. Building on those basics the tutorial will then present a high level description of how video compression works and the trade-offs that can be made when selecting and implementing video compression components. An overview of various video compression algorithms will be provided, highlighting the differences between the algorithms. We will examine the effects of video compression on video quality and investigate some of the causes and resolutions of quality problems. Finally, there will be a brief overview of audio compression.

1:00 p.m. – 5:00 p.m.   Afternoon Tutorials

JMETC/TENA Capabilities for JADC2 and Distributed Testing
Gene Hudgins, JMETC/TENA

The Test and Training Enabling Architecture (TENA) was developed as a DoD CTEIP project to enable interoperability among ranges, facilities, and simulations in a timely and cost-efficient manner, as well as to foster reuse of range assets and future software systems. TENA provides for real-time software system interoperability, as well as interfaces to existing range assets, C4ISR systems, and simulations. TENA, selected for use in JMETC events, is well-designed for its role in prototyping demonstrations and distributed testing.

Established in 2006 under the TRMC, JMETC provides readily-available connectivity to the Services' distributed test capabilities and simulations. JMETC also provides connectivity for testing resources in the Defense industry and incorporation of distributed testing and leveraging of JMETC-provided capabilities by programs and users has repeatedly proven to reduce risk, cost, and schedule. JMETC is a distributed LVC testing capability developed to support the acquisition community during program development, developmental testing, operational testing, and interoperability certification, and to demonstrate Net-Ready Key Performance Parameters (KPP) requirements in a customer-specific Joint Mission Environment.

JMETC is the T&E enterprise network solution for secret testing, and uses a hybrid

network architecture – the JMETC Secret Network (JSN), based on the SDREN. The JMETC MILS Network (JMN) is the T&E enterprise network solution for all classifications and cyber testing. JMETC provides readily available connectivity to the Services' distributed test capabilities and simulations, as well as industry test resources. JMETC is also aligned with JNTC integration solutions to foster test, training, and experimental collaboration.

TRMC Enterprise Big Data Analytics (BDA) and Knowledge Management (BDKM) has the capacity to improve acquisition efficiency, keep up with the rapid pace of acquisition technological advancement, ensure that effective weapon systems are delivered to warfighters at the speed of relevance, and enable T&E analysts across the acquisition lifecycle to make better and faster decisions using data that was previously inaccessible, or unusable. BDA is the application of advanced tools and techniques to help quickly process, visualize, understand, and report on data. JMETC has demonstrated that applying enterprise-distributed BDA tools and techniques to T&E leads to faster and more informed decision-making that reduces overall program cost and risk.

TRMC has been working with Joint Staff and Air Force JADC2 Cross-Functional Teams (CFTs) regarding JADC2 and Multi-Domain Operations (MDO), to inform them on TENA/JMETC and other TRMC capabilities that could be leveraged to support the emerging Joint Staff Joint Domain Environment (JDE). Additionally, TRMC has been engaged with Army Futures Command (AFC) throughout the year in a number of areas including assessing TENA/JMETC Support coupled with Big Data Analytics (BDA), expanding OSD TRMC collaboration and cooperation to other mission areas including, but not limited to, Cyber, BDA, Knowledge Management (KM), Machine Learning (ML), and Artificial Intelligence (AI).

This tutorial will inform the audience as to the current impact of TENA, JMETC, and BDA on the T&E community; as well as their expected future benefits to the range community and the warfighter.

T & E in a Multi-domain Operational Environment

Real World Telemetry over IP
Gary Thom, Delta Information Systems

As telemetry ranges are making the move to network centric architectures, it is worth considering the lessons learned over the previous 10 years of designing, installing, troubleshooting and optimizing telemetry data distribution over IP networks. This tutorial will begin with the motivation for moving to Telemetry over IP (TMoIP). It will then provide a basic networking foundation for understanding TMoIP and TMoIP formats. With this basis, we will be able to discuss network design considerations and tradeoffs for a successful TMoIP deployment. Finally, we will present some of the real-world problems and issues that may arise in a TMoIP system and the troubleshooting techniques that can be used to resolve them.

T&E as a Part of Agile Development
Robin Poston, PhD - System Testing Excellence Program, University of Memphis, and Wayne Dumais - Deputy T&E, Department of Homeland Security (DHS)

To discuss T&E in support of agile development, we need to explore the sequence of the evolution of the agile methods, rationale for the application of different methods, compare traditional and agile software development approaches, discuss research conclusions regarding the agile method's impact on software performance, review benefits and challenges of agile, and appreciate the fit of agile methods with Systems Acquisition Life Cycle. Furthermore, in this tutorial we will also discuss when to use agile, the role of the tester on agile projects, and various kinds of testing applicable to agile software developments.

14-July   Second Day - Plenary Sessions, Technical Sessions, & Exhibits

8:00 a.m.   Welcome:
                Mr. Pete Crump – ITEA President
                STAR Spangled Banner
                Mr. Charles Garcia, MDO Program Chair

8:10 a.m.   Welcome by WSMR Command Group

8:15 a.m.   Opening Keynote: George Rumford, Director (Acting), Test Resource Management Center

9:00 a.m.   Keynote Speakers: Dr. Sandra Hopson, (SES), Acting Principal Deputy, DOTE &
                Mr. Chris Collins, (SES), Director Developmental Test, Evaluation, and Assessments, OUSD
                (R&E)

9:45 a.m.   30-MINUTE BREAK IN THE EXHIBIT HALL

10:15 a.m.   Keynote Speaker: Ken Peterman, President, Viasat Government Systems

T & E in a Multi-domain Operational Environment

04/19/21

11:00 a.m.   **Test Resource Management Center Panel**

Panelists:
- Ryan Norman, Deputy JMETC, Test Resource Management Center
- Geoff Wilson, Deputy TE/ST and PM Hypersonics Portfolio
- Kenny Sanchez, T&E/S&T C4T Efforts

12:30 p.m.   **Lunch Break in the Exhibit Hall**

1:30 p.m.   Featured Speakers: Chris Klug, Director, Multi-Domain Test Force, Air Force and Michael "Hijack" Fritts, Lt Col, USAF, Chief, Fighter Operations & Training, AFMC/A3V

2:30 p.m.   Featured Speaker: Paul Mann, (SES) Department of the Navy's, Chief Engineer, DASN (RDT&E)

3:00 p.m.   Featured Speaker: Rick Quade, (SES) ,Director for Innovation, Technology Requirements and T&E (N94)

3:30 p.m.   **30-MINUTE BREAK IN THE EXHIBIT HALL**

4:00 p.m.   Technical Track Sessions

6:00 p.m.   **RECEPTION IN THE EXHIBIT HALL**

15-July   **Third Day - Plenary Session, Technical Sessions, & Exhibits**

8:00 a.m.   Welcome and overview of the day's events by Mr. Charles Garcia – MDO Program Chair

8:30 a.m.   Keynote Speaker: William B. Nelson, (SES), Director, Army Futures Command (AFC) Assured Positioning, Navigation and Timing (APNT) Cross Functional Team (CFT)

9:15 a.m.   Featured Speaker: Colonel (P) Tobin Magsig, Commander Joint Modernization Command

9:45 a.m.   Featured Speaker: Gary Anaya, Chief, U.S. Army Fires Center of Excellence /AFC- FCC Capabilities Development & Integration Cell (CDI-Cell)

10:15 a.m.   **30-MINUTE BREAK IN THE EXHIBIT HALL**

10:45 a.m.   Featured Speaker: Dr. Randy Garrett, Program Manager, Strategic Technology, DARPA

11:20 a.m.   Featured Speaker: Col. Nick Hague, Director of Test and Evaluation, Space Force

T & E in a Multi-domain Operational Environment

04/19/21

12:00 p.m.   **Lunch Break in the Exhibit Hall**

1:15 p.m.   **University JADC2 Related Capabilities**
Panelists:
- ➢ University of Texas at El Paso
- ➢ New Mexico State University

2:30 p.m.   Jerry Tyree, Deputy Test Center Commander, White Sands Missile Range – *"MRTFB Support of JADC2"*

3:00 p.m.   **30-MINUTE BREAK IN THE EXHIBIT HALL**

3:30 p.m.   Technical Track Sessions

Exhibit Hall Hours
Tuesday, July 13th – 8:00am – 5:30pm, Exhibitor Set-up
Wednesday, July 14th – 9:00am – 6:00pm (Networking Reception 6:00-8:00pm)
Thursday, July 15th – 9:00am – 4:00pm
Thursday, July 15th – 4:00pm – 8:00pm, Exhibitor Move-out

Program Planning Committee (MDO@itea.org)
Program Chair: Mr. Charles Garcia – Grey Beards
Technical Co-Chairs: Mr. Steve Aragon & Mr. Richard Martinez
IT/AV Co-Chairs: Mr. Armando Juarez & Mr. Carlos Maez
Exhibits and Sponsorships: Mrs. Lena Moran – 951-219-4817
Registration: info@itea.org or 703-631-6220

Host Hotel
[Radisson Hotel El Paso Airport](#)
1770 Airway Blvd.
El Paso, TX 79925
Phone: 915-772-3333

ITEA is pleased to offer a special below government per diem rate of **$98 per night.** This property is the host hotel and when making your reservation you must indicate you are with the ITEA workshop. To receive the special rate call 915-772-3333 or click the Radisson link above to book your reservation by **June 21, 2021.**