

## Live Training Requirements and Capability Gaps Abstract

The Live Training Simulations Requirements and Capability Gaps Panel brings together key Government, Industry and Academic experts to discuss near, mid and far-term initiatives to fulfill the Capability Gaps in support of the Army Warfighting Challenges (AWFC). No opportunities for bidding will be presented during this panel. All PM TRADE bid opportunities will be briefed at the end of the day. The panel will present user requirements, proposed science and technology needs, and current industry and academic perspectives on the future of Live Training tactical engagement and instrumentation systems.

The future of live training must include the capability to overcome current bandwidth and “laser-based” limitations to ensure an accurate portrayal of “Live Effects” both for direct and indirect fire. S&T investment into technologies that enable replication of the flyout effects for both NLOS and LOS weapon systems is key. The future capabilities must also address the use of embedded or dual use technologies for mounted and dismounted systems and sensors.

The panel will also address the integration of technologies such as Augmented Reality which when blended or injected into the Live Training environment may enable “real world” interaction and engagement for both force-on-force and force-on-target training.

This panel is for those interested in gaining a better understanding of how future for Live Training Simulations will address the following four AWFCs: Enhance Training (#8); Improve Soldier, Leader and Team Performance(#9); Ensure Interoperability and Operate in a Joint, Interorganizational, and Multinational (JIM) Environment(#14); and Integrate Fires(#17). Project managers, engineers, technology managers, and business development personnel should attend this interactive session. The panel will provide presentations and will interact through real time questions from the audience.



Central Florida Chapter

**NDIA**

National Defense Industrial Association

# LIVE TRAINING PANEL

**MODERATOR  
COL (RET) DE VOORHEES**

# LIVE TRAINING PANELISTS

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## Government

- COL Vince Malone – Project Manager, Training Devices (PM TRADE)
- LTC Barry King – TRADOC Capability Manager (TCM) - Live
- Mr. Tom Scarbath – TCM Ranges
- Mr. Brian Kemper – Chief Engineer, PM TRADE

## • Industry & Academia

- Mr. Lipton Clarke – Saab Defense and Security USA, LLC
- Mr. Steve Blahnik – Cubic Global Defense
- Mr. Pete Tewksbury – Inertial Labs Inc.
- Dr. Charles Hughes – UCF Computer Science Division, Co-Director, IST/Synthetic Reality Lab

# REALISTIC TRAINING IN A COMPLEX WORLD\*

Current Army home-station training is not realistic, demanding, nor challenging enough to properly prepare our forces to improve and thrive in ambiguity and chaos.

Training



Reality



# LIVE TRAINING SIMULATIONS\*

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- Future Tactical Engagement & Instrumentations must:
  - Replicate Live Fire conditions in force-on-force & force-on-target training
  - Overcome bandwidth & laser-based (MILES) system limitations
  - Overcome latency & inaccurate portrayal of “Live effects”
  - Maximize use of embedded or dual use capabilities for mounted and dismounted systems & sensors

\* CAC-T Training and Education Related Science and Technology (S&T) Priorities Memo, dtd 26 Mar 2015

# POTENTIAL LIVE TRAINING TECHNOLOGIES

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- **Tactical Engagement & Instrumentation**
  - Real-time, realistic simulated munitions
  - “Flyout” effects for NLOS & LOS weapon systems
  - Improved use of bandwidth for training, tactical & strategic networks.
- **Augmented Reality**
  - Blend or inject computer-generated entities into live training
  - Enable real world interaction and engagement for live F-O-F & F-O-T training
  - Reduce Soldier risk while providing doctrinally-based platform supported TTPs
  - More realistic and effective training at point of need.

# INDUSTRY PANELIST - Steve Blahnik

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- **Background:**
  - **Steve Blahnik** : Cubic Global Defense, Have been the Chief Engineer for Ground Ranges the last 7 years, now the General Manager. Things we do for Live training
  - Build IWS, TVS
  - Currently contracted to deliver AMITS; mobile range instrumentation system
  - Contracted with the Marines to provide a NLOS solution for 5 weapon types
- **Why this is important:**
  - Need to understand the GAPS in training on laser based man and vehicle solutions, (embedded training, Precision Gunnery, GPS in laser code, NLOS, adjust for fire, multi national training)
  - Need to understand GAPS in training for field effects: (latency, player to player coms, indoor tracking)
- **Government should invest money and partner with industry to:**
  - Develop the laser protocol, the laser technology is developed by industry
  - AR industry is leaning forward needs help to ruggedize and make useable in the field
  - Work with Industry and vehicle MFGs to maximize embedded training
  - Further NLOS continue to improve accuracy to the point it can be used on a small arm weapon
  - Improve Indoor tracking accuracy

# INDUSTRY PANELIST – Lipton Clarke

- **Background**

- **Lipton Clarke:** Project Manager, Saab Defense and Security USA, LLC. Currently supporting the I-MILES CVTESS program. Has been an electrical/mechanical engineer on Saab Targetry in support of the ATS I, DRTS, & CARTS contracts, also as PM supporting the HITS LT2 IRS program.
- Things we do for Live training
  - Built communication backbone to support Home Station Instrumentation Training
  - Provide Force on Target Solutions
  - Combat Vehicle Instrumentation

- **Why this is important:**

- Need to understand the dynamics in training for future T-IS / A-TESS and Synthetic Environments. (Network performance criteria, Next Generation MILES – laser development, Gunnery Training, embedded solutions transitions, medical simulation integration, CBRN)
- Need to understand Performance Behaviors as the Army transitions from traditional Edge Device Solutions to T-IS / A-TESS (Centralized verses De-centralized architectures/multi-role components; increase human performance and lifelong learning as applied to future systems development)

- **Government should invest money and partner with industry to:**

- Invest in the Next-Generation MILES
- Mobile applications and Augmented Reality
- Develop an Embedded Training Roadmap
- Solution Performance Behavior Models

# ACADEMIC PANELIST – Charlie Hughes



- **Who am I?**

- **Charlie Hughes:** UCF Prof. in Comp. Sc. and Co-Director of Synthetic Reality Lab (SREAL).
- In simulation since 1962; Ph.D. in 1970 (Penn State); 35 years at UCF with emphasis in virtual environments for last 25. Collaborative research across campus.



- **Research Emphasis of SREAL Team and Its Partners:**

- Human surrogates: Virtual and Physical, e.g., robotics, stand-ins for humans
- Funded by NSF (protective strategies), ONR (human performance training & education) and Bill & Melinda Gates Foundation (professional development)



- **Basic Research:**

- Computer Networks: Low latency protocols for remote control of surrogates
- Computer Graphics: Realism; Stitching multiple sources on non-uniform surfaces
- Human-Computer Interaction: Manifestations and training effectiveness; Multisensory, e.g., touch on non-uniform surfaces, robotic sensing of material properties; Relation of physical and social presence; Cognitive/physical loads; Debriefing; Body ownership



- **Evidence and Scaling:**

- Demonstrate efficacy, effectiveness and persistence of training/educ. experiences
  - Four 10-minute sessions positively effect a teacher's techniques
  - Studies of behavior/manifestation effects on compliance, belief, ...
- University-Industry-Government-Foundation Partnerships



# INDUSTRY PANELIST – Pete Tewksbury

- **Background:**
  - **Pete Tewksbury:** Inertial Labs, Inc., Vice President and Co-Founder working specifically on technologies for live/virtual training for 11 years.
  - Focus on weapon mounted/man-wearable sensor technologies for both live training and operational environments
- **Why this is important:**
  - My two cents: We will fight the way we are trained, but currently are we training the way we fight?
    - Lack of critical support weapons in our most realistic means of training (Live FoF) leads to improper fighting
- **What we need to see from the government:**
  - What we have seen – Some funding happening for advancements in indirect fire weapons, AR/VR, LVC, Laser technologies, sensors...
  - What we have not seen enough of..
    - More cooperation and combined efforts between operational and training environments – embedded sensor technologies benefits both so work together on them
    - More focus on bringing diverse technologies together – advanced sensor fusion, combining terrain data with AR visualization and weapon orientation, etc.
  - What we will get goes beyond just adding some new functions to live training
    - Digital After Action Review, Automated data analytics, new measurable data