TILO: Capability Areas of Interest

Capability Areas of Interest

- PEO STRI and the Army rely on new ideas and emerging technologies developed by industry. -

Training Products and Services -Live-

- Virtualization Technologies
- Live Force-on-Force Medical Capabilities
- Mobile Multi-media Wireless Networks
- Embedded Training
- Accurate and Affordable High-Fidelity Weapon Orientation Sensor
- Accurate and Affordable Geo-location Capabilities for Indoor and GPS-denied Environments
- Adaptive Behavior Targets

Training Products and Services -Virtual-

- Virtualization Technologies
- High-Fidelity Immersive Training Environment
- Synthetic Natural Environment Enhancements
- Virtual Environment
- Interoperability
- High-Fidelity Medical Simulations
- Sensor Technologies

Training Products and Services -Constructive-

- Global Simulation Capability and Simulation as a Service
- Hybrid Simulation
- Human Intelligence Collection Operations Modeling
- Dynamic Model Resolution
- Environmental Correlation

Training Products and Services -Gaming-

- Virtualization Technologies
- Synthetic Natural Environment Enhancements
- Virtual Environment
- Avatars for Human Intelligence

Testing Products and Services

- Terminal Event Radar Performance Zone
- Time-Space Position Information (TSPI) in GPS-denied Environment
- Software-defined Radios (SDR)/Cognitive Radios/Dynamic Spectrum Assess (DSA) Technologies
- Remote Target Control System
- Fuel Cell
- Digital Radio Frequency Memory (DRFM)

Capability Areas of Interest

Training Products and Services – Live

- **Virtualization Technologies:**
  Delivery of training and simulation services from centrally located simulation/processing hubs to provide better utilization and efficiency, and simplified support and maintenance.
- **Live Force-on-Force Medical Capabilities:**
  Realistic casualty assessment algorithms based on weapon, ammunition, impact location, and use of body armor to replace the existing MILES casualty cards; Capability to perform Buddy/Self Aid via MILES devices; Allow combat medics to treat, administer aid to, and perform evacuations of "wounded" participants; Develop a medic's field equipment pack to track usage during a training exercise; "Instrument" these capabilities.
- **Mobile Multimedia Wireless Networks:**
  Highly scalable and mobile multimedia wireless networks using spectrum efficient and frequency agile software defined radio technology with QoS. Capable of providing seamless movement across vast training/testing areas with low latency MANET, multi-hop and point to multipoint connectivity.
- **Embedded Training:**
  Technologies for embedding training and simulation capabilities on tactical platforms and leveraging tactical platform hardware to perform dual functions to support both operational as well as training capabilities and mission rehearsal functions. Alignment with the VICTORY (Vehicular Integration for C4ISR/EW Interoperability) architecture and standard initiative for integrating electronics on Army ground vehicles and limiting SWaP-C impact to the tactical platform.
- **Accurate and Affordable High Fidelity Weapon Orientation Sensor:**
  Provides high fidelity pointing vectors for weapons within their operational environments (i.e., ferrous metals); Accuracy: < .1 degrees; Small form/fit, SWaP-C, Non-obtrusive to player/weapon; Simple calibration method.
- **Accurate and Affordable Geo-location Capabilities for Indoor and GPS-denied Environments:**
  A high fidelity position/location system for real-time tracking soldiers in an indoor/urban or GPS-denied environment; Accuracy: 6-8 inches/15-17 cm (T); 3-4 inches/10 cm (O); Low impacts to both soldier and infrastructure; Instrumentation System interoperability.
- **Adaptive Behavior Targets:**
  Provision of an autonomous behavior target that portrays an asymmetric and reactive threat using sensor inputs. Enhanced target realism with realistic thermal/IR signatures, improved mobility (i.e. track-less) and bi-directional voice capabilities. Capable of inter-target communication/data sharing and reactions to events on other targets. Capable of supporting live fire with minimal failures/high RAM.

Capability Areas of Interest

Training Products and Services – Virtual

- **Virtualization Technologies:**
  Delivery of "distributed" training and simulation services from centrally located simulation/processing hubs to provide better utilization and efficiency, and simplified support and maintenance. Effective implementation of Cloud computing, virtualization and SOA concepts/technologies.
- **High Fidelity Immersive Training Environment:**
  Believable, well-developed and economically feasible “interactive” computer-generated virtual humans and targets. Trainee interacts with, controls and commands virtual humans and targets in the ITE using natural language, motions and gestures. Realistic & cost effective locomotion of the trainee in the ITE. Effective implementation of VR/AR/MR technologies.
- **Synthetic Natural Environment Enhancements:**
  Support air and ground mission rehearsal systems with rapid updates to existing terrain databases. Allow trainee to interact with physics-based models and receive appropriate feedback in the synthetic environment associated with route clearance/IED defeat and construction equipment training systems. Manipulating of physics-based virtual objects in a virtual environment.
- **Synthetic Natural Environment Enhancements:**
  Common, robust weather and atmospheric simulation for real-time training systems in a DIS environment. Realistic life form representation in virtual simulations.
- **Virtual Environment:**
  Modeling of Obscurants/Illumination: Improve modeling of obscurants and illumination that impact sensors-behaviors and target engagement.
- **Interoperability:**
  Interoperability between virtual simulations, between virtual and constructive simulations, between virtual and live simulations. Common correlated terrains, fair fight engagements, SAF behaviors, etc.
- **High Fidelity Medical Simulation:**
  Medical simulations whose interaction with the virtual world more realistically portrays the level of fidelity necessary to readily transfer the learning experience to actual patients; high fidelity medical simulations should match the vagaries of the individualistic nature of the human body and be easily User re-programmable to capture multiple nuances of a similar condition.
- **Sensor Technologies:**
  Sensor technologies to support immersive training environment:: head tracking, eye tracking, weapons orientation, haptics, motion tracking, etc

Capability Areas of Interest

Training Products and Services – Constructive

- **Global Simulation Capability and Simulation as a Service:**
  Delivery of training and simulation services from centrally located simulation/processing hubs to provide better utilization and efficiency, and simplified support and maintenance. Effective implementation of Cloud computing, virtualization and SOA concepts/technologies.
- **Hybrid Simulation:**
  That allow running of federations either in non-time managed, best effort mode or time managed, reliable delivery mode or runtime combination of these two modes utilizing a single simulation data distribution mechanism.
- **Human Intelligence Collection Operations Modeling:**
  Modeling and simulation of the complex Human Intelligence Process of collection and reporting. Simulation of human sources with unpredictable and sometimes unrealistic results. Modeling unpredictable human intelligence sources to produce more realistic results. Conveying of range of emotions on synthetic voices.
- **Dynamic Model Resolution:**
  Ability to dynamically load and unload model components during runtime to vary the capabilities of entities.
- **Environment Correlation:**
  Tools, technologies and processes to support quantification of correlation in environment databases and mechanisms to facilitate fixes and workaround.

Capability Areas of Interest

Training Products and Services – Gaming

- **Virtualization Technologies:**
  Delivery of training and simulation services from centrally located simulation/processing hubs to provide better utilization and efficiency, and simplified support and maintenance. Effective implementation of Cloud computing, virtualization and SOA concepts/technologies.
- **Synthetic Natural Environment Enhancements:**
  Support air and ground mission rehearsal systems with rapid updates to existing terrain databases. Allow trainee to interact with physics-based models and receive appropriate feedback in the synthetic environment associated with route clearance/IED defeat and construction equipment training systems.
- **Virtual Environment:**
  Modeling of Obscurants/Illumination: Improve modeling of obscurants and illumination that impact sensors-behaviors and target engagement.
- **Avatars for Human Intelligence:**
  Custom characters, animations, and detailed features to create realistic avatars for close human interaction..

Capability Areas of Interest

Testing Products and Services

- **Terminal Event Radar Performance Zone:**

  The ability to capture radar measurements and signature collections for terminal event radar performance zone; Requires collection of high-resolution coherent data for specialized measurements: Deployment of closely spaced objects; Miss distance; Relative separation; Attitude; Kill and damage assessment; Debris characterization.

- **Time-Space Position Information (TSPI) in GPS Denied Environment:**

  High fidelity position/location system for real-time tracking in an indoor/urban or GPS-denied environment.

- **Software Defined Radios (SDR)/Cognitive Radios/Dynamic Spectrum Assess (DSA) Technologies:**

  Affordable approach to support test/training applications; Configurable multi-spectrum SDR/Cognitive radios; spectrum efficient, frequency agile; small form/fit.

- **Remote Target Control System:**

  Low cost sophisticated remote target control; Simultaneous remote control of mixed target platforms; remote control in a GPS denied environment.

- **Fuel Cell:**

  Small, low cost, light weight, efficient fuel cells for dismounts.

- **Digital Radio Frequency Memory (DRFM):**

  Physics/effects modeling of Digital Radio Freq Memory (DRFM) waveforms in M&S and injection for electronic attack simulators.