



Scenarios for Training Teamwork Skills in Virtual Environments with GIFT

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Agenda

- Overview of goals and approach
- Description of training environment
- Scenario description
- Teamwork measurement approach
- Conclusions/next steps

Overview

- Teamwork and task work skills are both essential elements of team performance.
- Breakdowns in teamwork skills, such as coordination and communication, and emergent team states, such as cohesion, can lead to mission failures (Wilson, Salas, Priest, & Andrews, 2007).
- While the importance of teamwork concepts may be recognized, effective training of these skills remains a challenge.
- The overall objective of this effort is to develop and demonstrate a system capable of training and assessing teamwork skills for medium to large teams within GIFT and a rich virtual training environment.

Objectives

- Demonstrate the utility of GIFT for adaptive training of teamwork skills within a virtual environment.
 - Utilize Virtual Battlespace 3 (VBS3)
 - Develop and implement realistic training scenarios that provide opportunity for practice and assessment of teamwork skills
 - Extend GIFT to larger organizational structures (e.g., 9 person squads).
- Demonstrate how unobtrusive measurement methods can effectively assess teamwork processes, states, and performance.
 - Traditional methods rely on expert observer ratings and self-report surveys
 - Initial focus on task cohesion, coordination, and communication

Training Environment - GIFT

- Most efforts to date in GIFT have focused on individual training, dyads, or triads.
- We seek to extend GIFT to squad-size (two four-person fire teams and a squad leader) simultaneous team training.
- Practical considerations of scaling GIFT include
 - Integrating and coordination individual data;
 - Handling different individual roles;
 - Assessing team performance through integrated analysis;
 - Delivering individual and team feedback.

Training Environment – VBS3

- Virtual Battlespace 3 – Developed by Bohemia Interactive Simulations
- Used for tactical training and mission rehearsal.
- Widely used throughout the Army, and readily available at many facilities.
- Several previous efforts have already integrated GIFT and VBS3 (and previous versions).
- Capable of supporting rich and complex scenarios
- Cooperative tasks and communication tools ideal for teamwork training.



Scenario Constraints

- Must be implemented within the constraints of the simulation environment (VBS3);
- Must represent realistic tasks, interactions, and outcomes to ensure Soldier engagement and buy-in;
- Must support the training and assessment of teamwork-related constructs (e.g., coordination, communication, cohesion) that emerge as a function of the team members' interactions;
- Must allow team members to communicate both naturally and in a manner that enables assessment of communications for measurement purposes;
- Must initially focus on the squad level, but also enable larger team structures to train within the simulation environment;
- Be scalable to support higher echelon training objectives with more complex scenarios.

Scenario Overview

- Scenario adapted from Army Basic Leader Course (BLC) Combat Search and Rescue (CSAR) training scenario.
- Scenario takes place along an approximately 1 mile linear path through a heavily wooded area.
- F-16 pilot has ejected in the area and medical condition is unknown.
- Primary objective is to perform search and rescue of downed pilot.
- Secondary objective is to reach a small village and perform a presence patrol and/or meet with village leaders.
- Hostile enemy militia known to operate in the area.
- At the start of training the Squad Leader will receive a FRAGO and INTEL which she will brief to the squad.

FRAGO

Situation: An F-16 was shot down over AO Texas at 0230. Pilot ejected and landed south of village. Medical condition is unknown.

Primary Objective: Search and rescue of downed pilot in the woodland south of village.

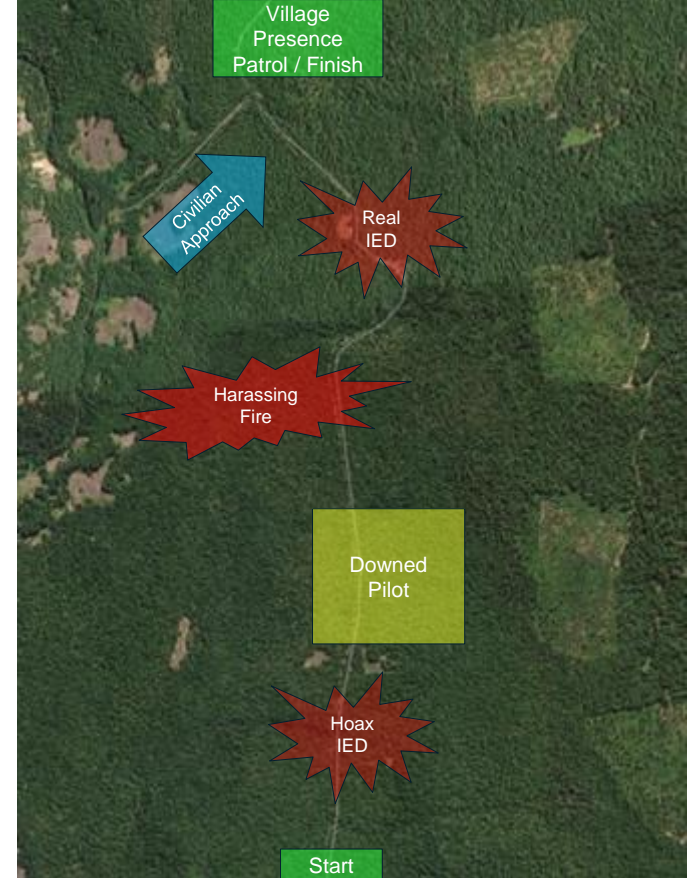
Secondary Objective: Presence patrol of village to sustain support against local enemy militia.

Service Support: HH-60 available for MEDEVAC

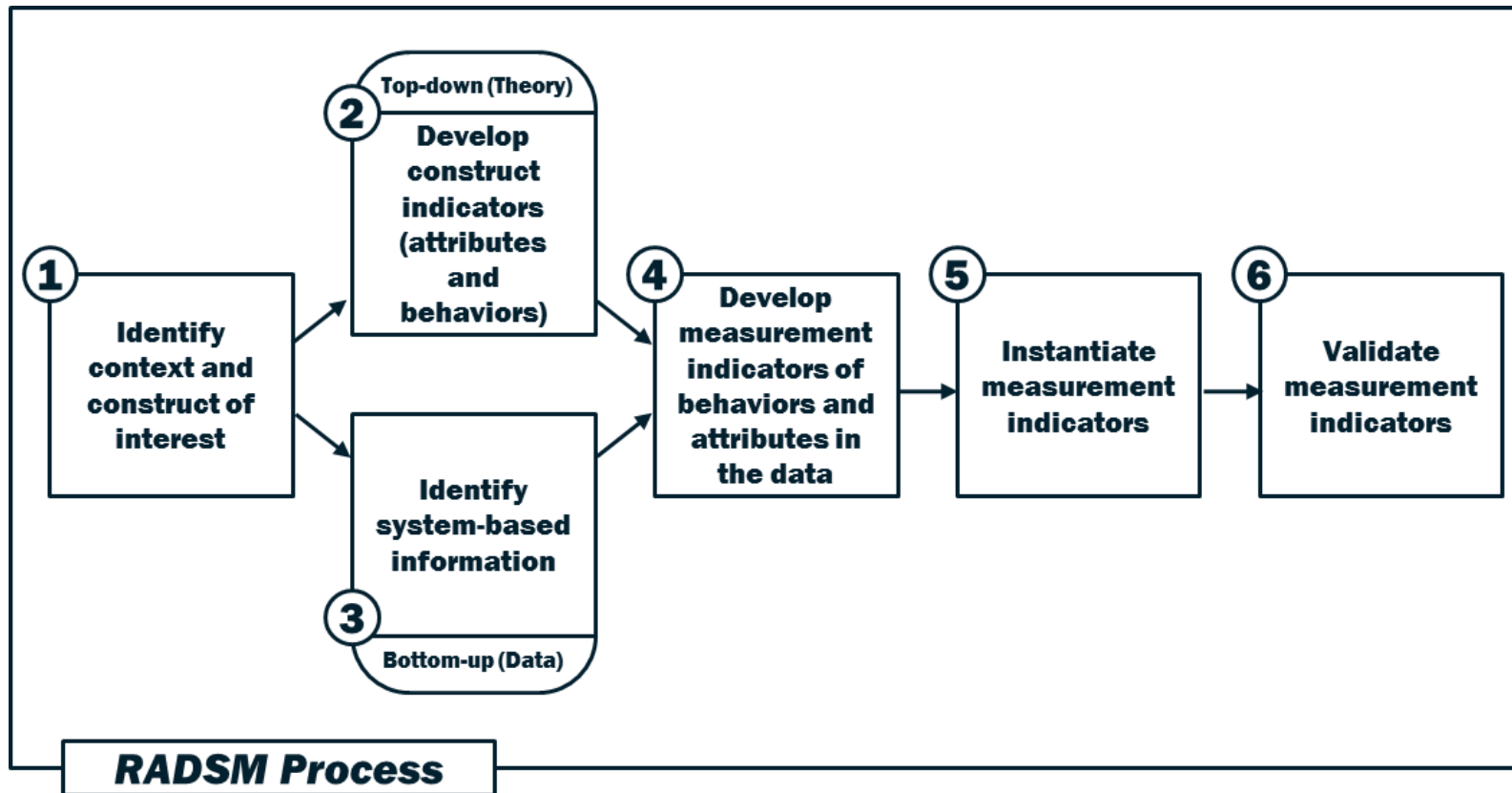
INTEL: Enemy militia known to operate in the area. Believed to be testing different IEDs. Militia is equipped with variety of small arms.

Scenario Elements

- Squad will start at a point south of the village along a linear road.
- Scenario will potentially include the following events:
 - **A hoax IED**
 - Identify presence of IED, communicate to team and higher echelon, conduct 5 Cs
 - **Downed pilot**
 - Find pilot, assess medical condition, call for MEDEVAC, and secure the landing zone
 - **Harassing fire from militia**
 - Suppress fire, maintain formation, neutralize threat, call clear, redistribute ammo
 - **A real IED**
 - Identify presence of IED, communicate to team and higher echelon, conduct 5 Cs
 - **Unknown individual approaches with a cart**
 - Notice the individual, escalate fire (show, shout, shoot), maintain formation
 - **Village presence patrol**
 - Must arrive in time to meet with village leader and conduct presence patrol



Unobtrusive Measurement Approach - RADSM



RADSM Measurement Example

- Step 1: Initial focus on task cohesion, coordination, and communication
- Step 2: Identify behavioral indicators associated with each construct
- Step 3: Identify data sources and data features relevant to construct
- Step 4: Develop measurement indicators based on evidence of behavioral markers in the data
- Step 5: Implement measures in GIFT
- Step 6: Validation study

Behavioral Marker	How would this be demonstrated?	Data Source(s)	Data Features	Analysis Method(s)
Members are actively working together and pitching in to reach team goals	All team members are communicating with each other	Chat logs	Sender/receiver of chats; number of chat messages sent by person	Compute # of messages sent by each team member; Assess the distribution of communication actions across team members
	Each team member is taking the actions that they are responsible for (e.g., detecting threats in their area)	Movement and action logs; List of team member responsibilities	Who did what action and when	Comparison of user movements / actions against their responsibilities
Occurrences of phrases like "great job everyone", "go team", "you're the best", "good work"; positive affirmations toward the team's work	Team members using these phrases in their chat communications with one another	Chat logs	Sender/receiver of chats; content of chat communications	Dialogue act analysis – sum instances of the use of words and phrases matching those associated with "positive affirmation"

Next Steps

- Continue to refine scenario(s) with Army SME and implement within VBS3
- Develop inventory of unobtrusive measurement indicators via RADSM process
- Implement measures GIFT and develop feedback strategy
- GIFT Architecture
 - Short term – Identify changes needed to support team training and develop strategy to quickly allow teams to utilize GIFT and VBS3
 - Long term – work with GIFT developers to implement architectural changes required for future team training
- Conduct experiments to validate the system as well as the teamwork measures

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