
Intelligent Forces for the Joint Fires and Effects Training System

The Institute for Creative Technologies
Soar Technology

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Background

- Joint Fires and Effects Training System

- Urban Terrain Module



- Open Terrain Module



Goal

- JFETS-05: Create CAS Trainer
 - Immersiveness from UTM
 - Training Capability from OTM
- Intelligent Forces
 - Intelligent, Non-Scripted Entities
 - Concurrent Development with JFETS-05

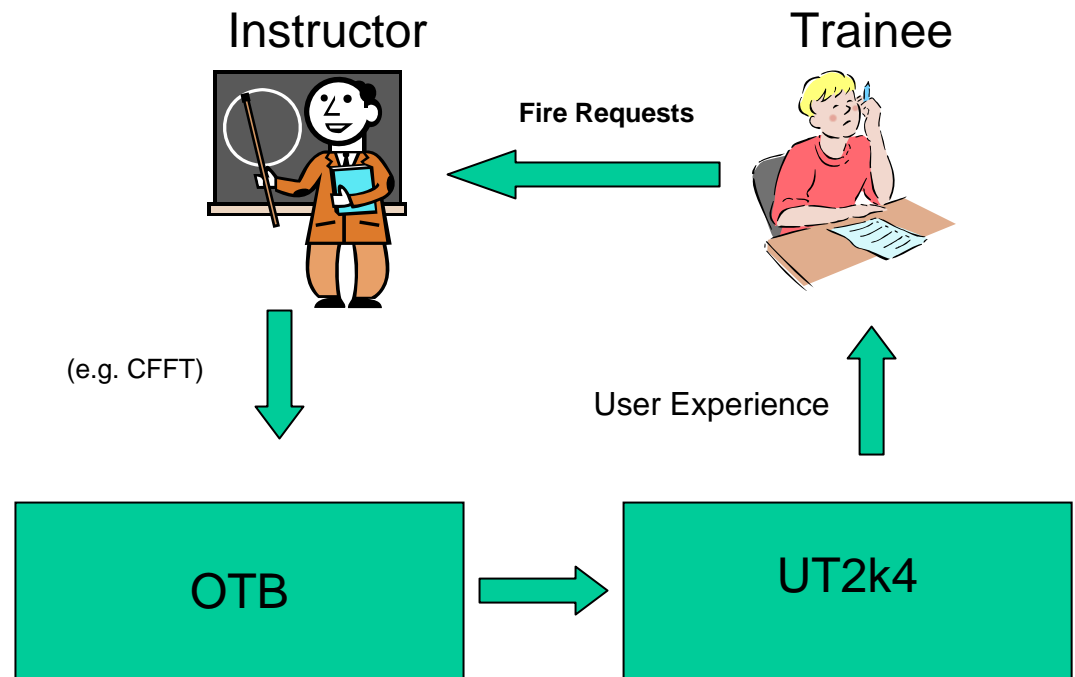
Intelligent Forces

- Motivation
 - Immersiveness requires rich, dynamic behaviors for OPFOR and Civilians
 - OTB behaviors not adequate
- Approach
 - Create OPFOR plans that get decomposed and executed by Soar within OTB

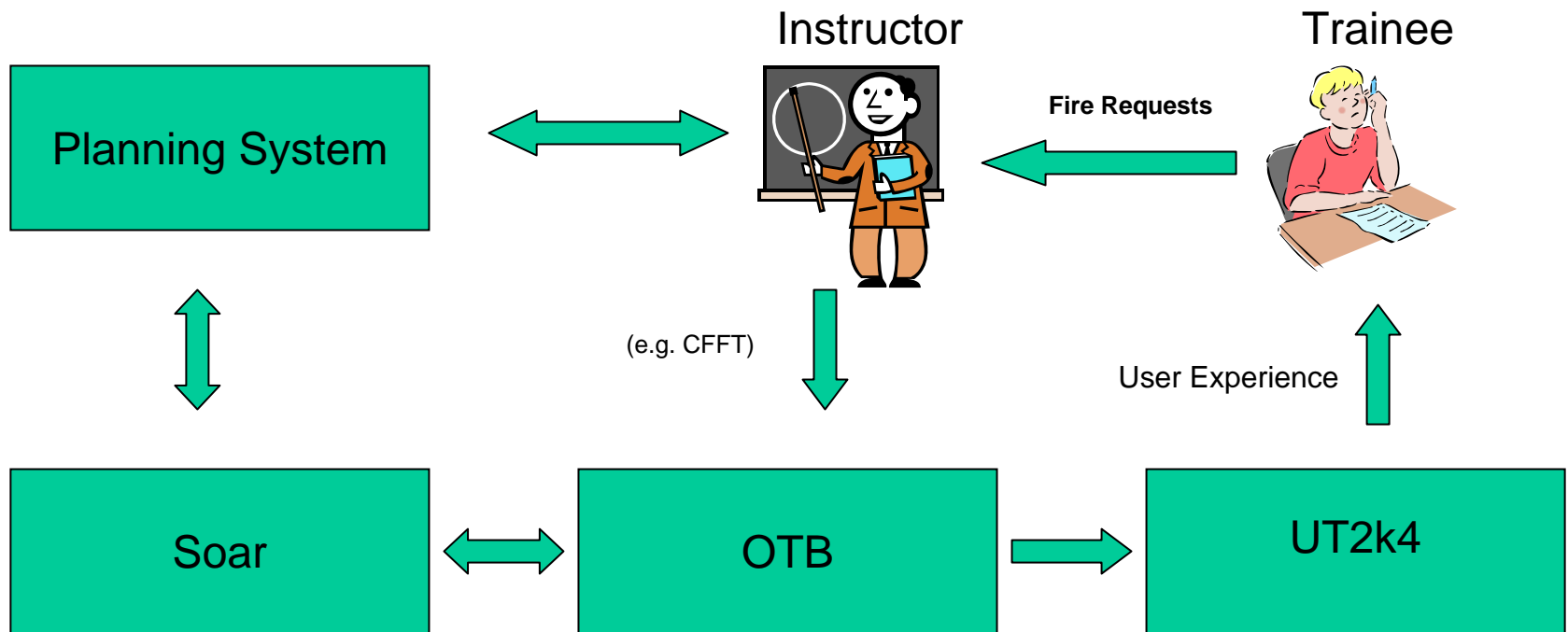
Outline of Approach

- Scenario Description
- Behavior Requirements
 - Planner Operators
 - Entity Actions
- Execute Actions Within OTB
- Execution Monitoring / Replanning
- Visualization Using Unreal Tournament

JFETS Architecture Diagram



IFOR Architecture Diagram



Scenario Description

- Trainee as a Forward Observer
 - Positioned at Ft. Sill's Thompson Hill
 - Observes Insurgents Staging an Attack
 - Makes Call for Fire requests
- Key Scenario Events
 - NGO Food Distribution Convoy
 - Iraqi National Army Convoy
 - US Quick Response Force

Entities

- OPFOR
 - Lookouts, AK-47s, RPGs, IEDs, etc...
- Civilians
 - Outdoor market area, wedding party, children playing, etc...

Example Behaviours

Single Entities

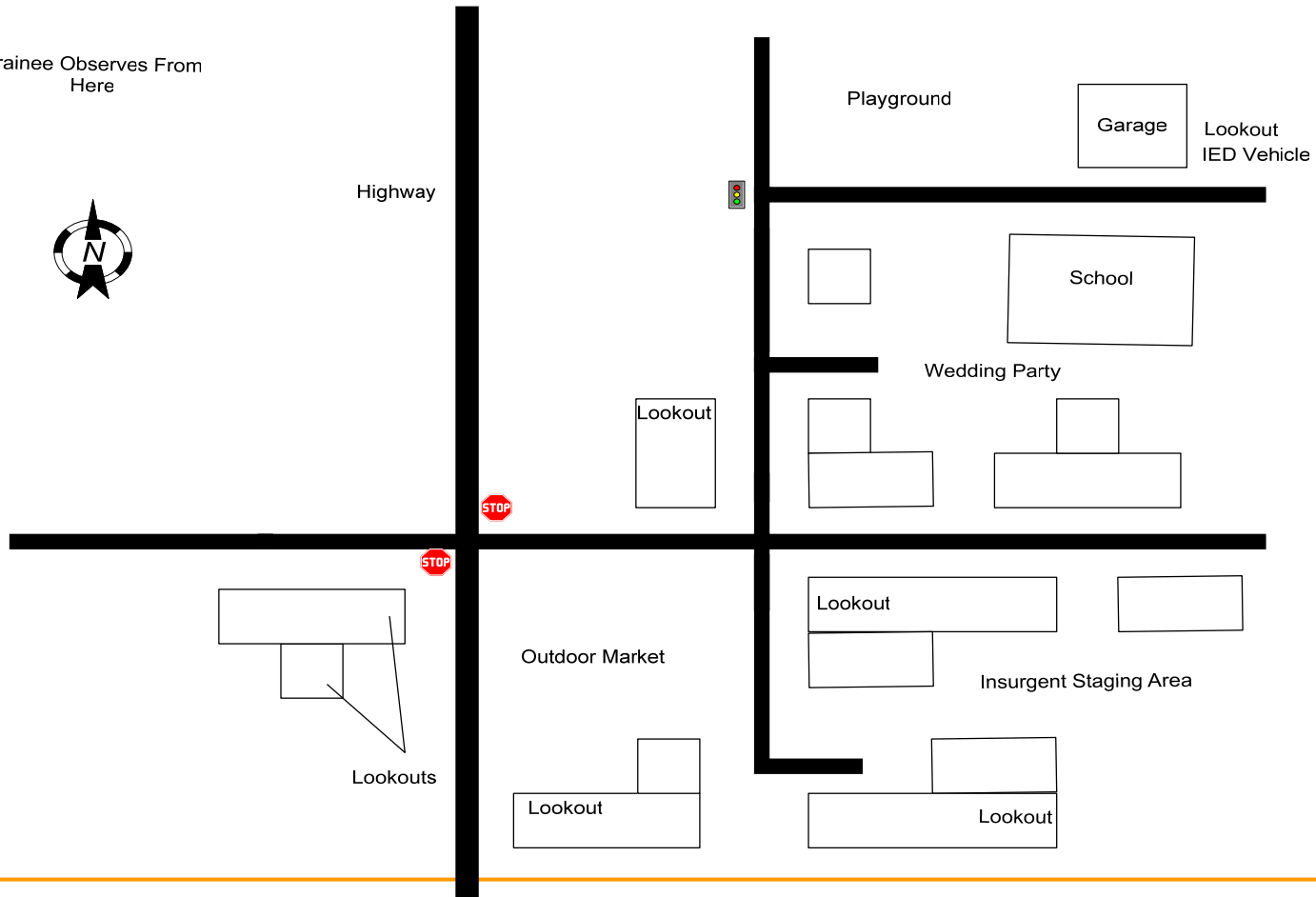
- *MoveTo*
- *RunTo*
- *TurnTo*
- *ChangeStance*
- *PlayAnimation*
- *ArmWeapon*
- *FireAt*
- *Reload*

3-5 Man AK-47/RPG Team

- *Move_Team*
- *Defend_Position*
- *Hold_Fire*
- *Gather_Collect_Weapons*
- *Attack_Assault_Team*
- *Attack_Suppress_Team*

Village Map

Trainee Observes From
Here



Planner Details

- Hierarchical Planner
 - Considering DPOCL, JSHOP2
 - Operators appropriate for 3-5 man teams
- Instructor Chooses a Goal and Plan Constraints
- Based on previous Adaptive Opponent work
 - Full Spectrum Command

Soar Details

- Responsible for decomposing plan operators into Soar rules
- Soar operators execute within OTB
- Soar monitors execution and makes replanning requests when plans fail
- Many interesting control options to consider - more from Bob Wray on this

Conclusions

- Challenges
 - Generating plans for complex domains is hard, re-planning is a challenge
 - Choosing the best control structure to manage 100s of entities using Soar
 - How to detect plan failure
 - Integration from many different groups within ICT as well as several contractors
- Rewards
 - A one of a kind training system used by Army