

Interactive Visualization of Situational Awareness



Soar Technology

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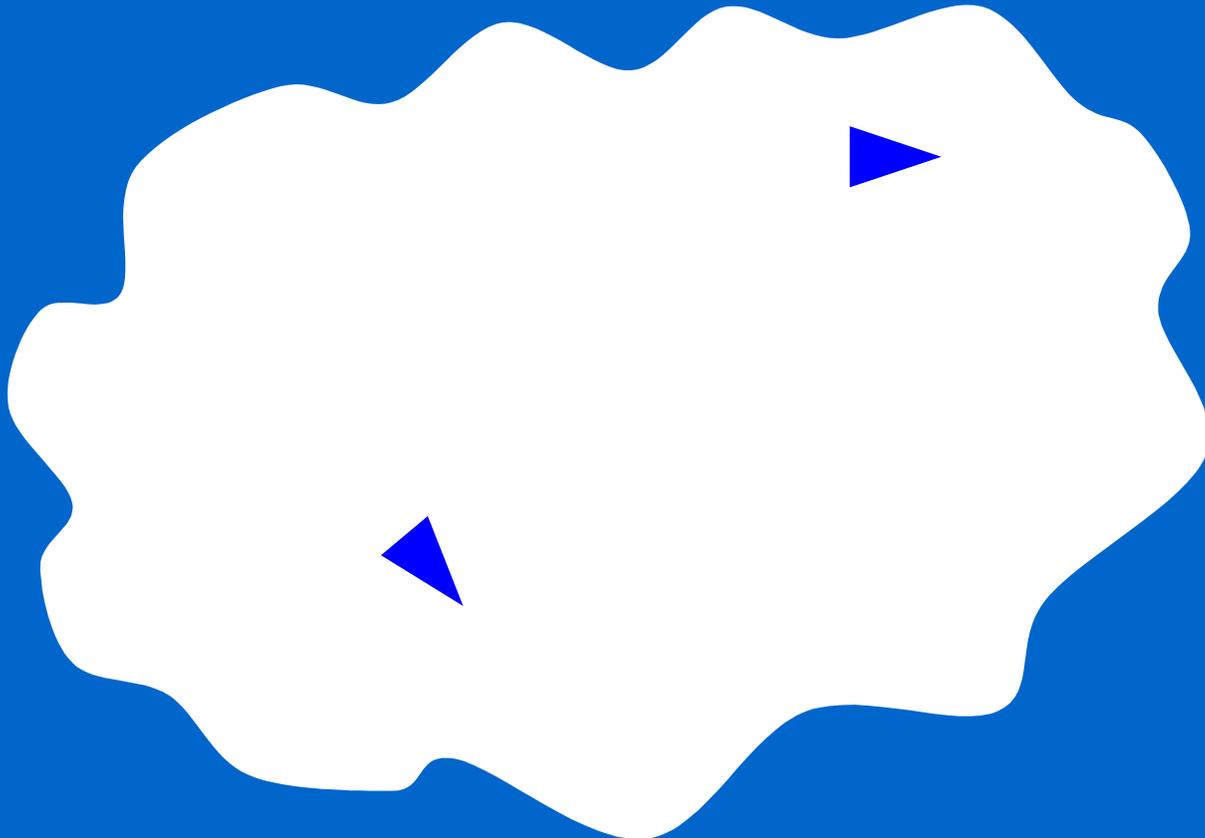
CGF's are inscrutable

- When they do something “wrong”, it is difficult to tell why.
- Sometimes they do things “right”, but for the wrong reasons
- “Behavior-based” verification has limitations



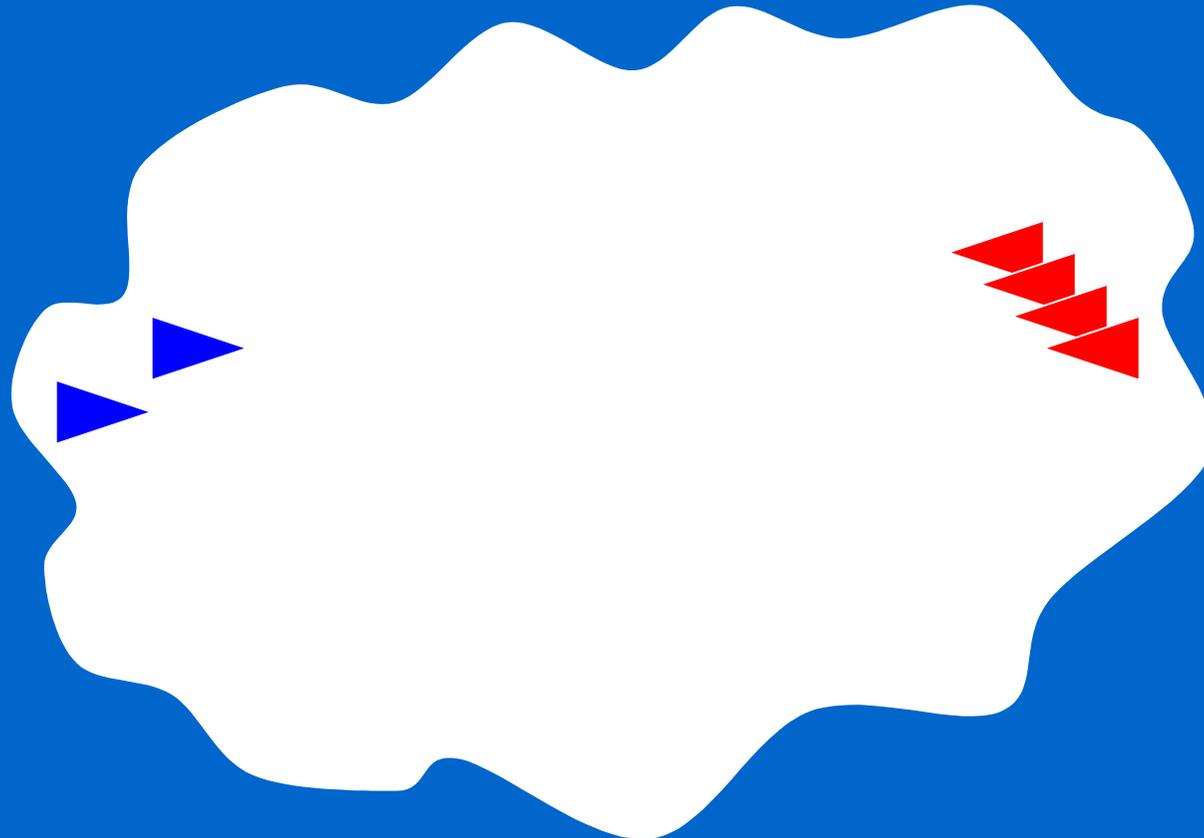
Example

- Why is the wingman flying over there?



Example

- Why isn't the blue fighter shooting?



The Situational Awareness Panel

- Graphically presents
 - Agent's current picture of situation
 - Current perception of world
 - Internal states and goals
 - Significant milestones that can (and should) affect behavior



The Situational Awareness Panel

Active goals:

- execute-mission
- intercept
- employ-weapons
- get-missile-lar
- cut-to-ls
- wait

Milestones:

Current Time:

```
00:02:37 Detect new contact A6
00:02:37 Detect new contact A4
00:02:42 Take off
00:02:43 Take off
00:02:44 Take off
00:08:30 Detect new contact A21
00:08:30 Detect new target group G2
00:08:30 Target agent A21 into group G2
00:08:30 Intercepting group G2
00:08:30 Agent A21 is primary threat
00:08:30 Agent A21 is NOT in LAR for aim-9
00:08:30 Agent A21 is NOT in LAR for aim-7
00:08:30 Agent A21 is NOT in LAR for aim-120
00:08:32 Detect new contact A28
00:08:32 Target agent A28 into group G2
00:08:32 Agent A28 is primary threat
00:08:32 Agent A28 is NOT in LAR for aim-9
00:08:32 Agent A28 is NOT in LAR for aim-7
00:08:32 Agent A28 is NOT in LAR for aim-120
00:08:33 Detect new contact A33
00:08:33 Target agent A33 into group G2
```

Altitude: 21426 Speed: 386 Heading: 336 Radar Azimuth: -29 Radar Elevation: -9

Blue
Red
Unknown
Inactive

Visual
Radar
Memory

Dismiss

View Scale (miles): 100



Expanding the Role of the SAP

- Project funded by Naval Air Warfare Center Training Systems Division (NAWCTSD),
US Navy
– Currently in first of three years
- Turn the SAP into a tool for developers, subject-matter experts, trainers, and trainees



Project Goals

- Improve effectiveness of training (by improving understanding of agent behavior)
- Improve validation and acceptance of agent behavior
- Improve agent development
- Generalize across behavior architectures



Technical Objectives

- Value-oriented improvements in usability
 - With help of Ritter's usability lab
- Symbol-level API
 - Target Soar, COGNET, task frames
- Behavior logging and replay
- Point-and-click question answering and behavior traceability
 - Building in part from Johnson's Debrief tool



Current Activities

- Design and usability interviews, and planned user studies
- Object-oriented symbol-level knowledge representation
 - To provide architecture-independent API
 - Prototype being implemented in TCL with symbol interface written in Soar

