

# C3Conflict

## C3Conflict a Simulation Environment for Studying Teamwork in Command and Control

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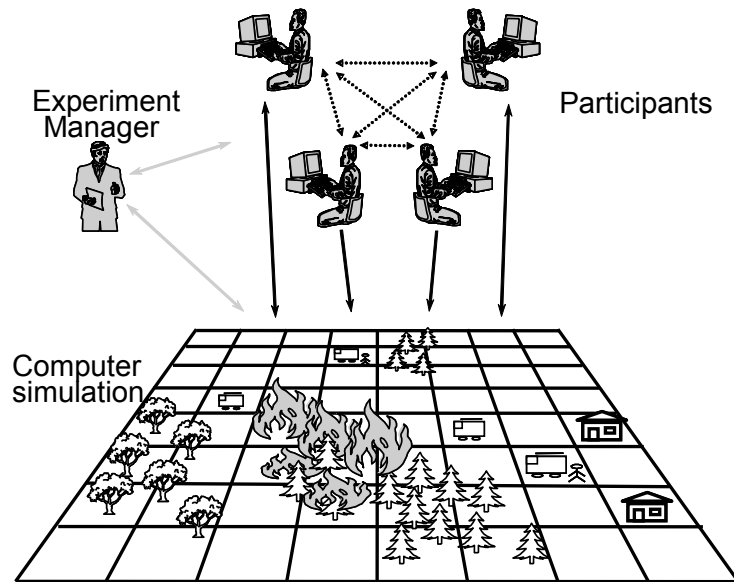
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# C3Conflict

- A simulation environment tailored to the **peace-keeping military domain**.
- **3 to 12 persons** can tackle a variety of common problems in team work and C2.
- Support work tasks and learning goals that exist for decision makers that works on the **tactical level**.
- The system **monitors the activities of all players**.
- Based on C3Fire.



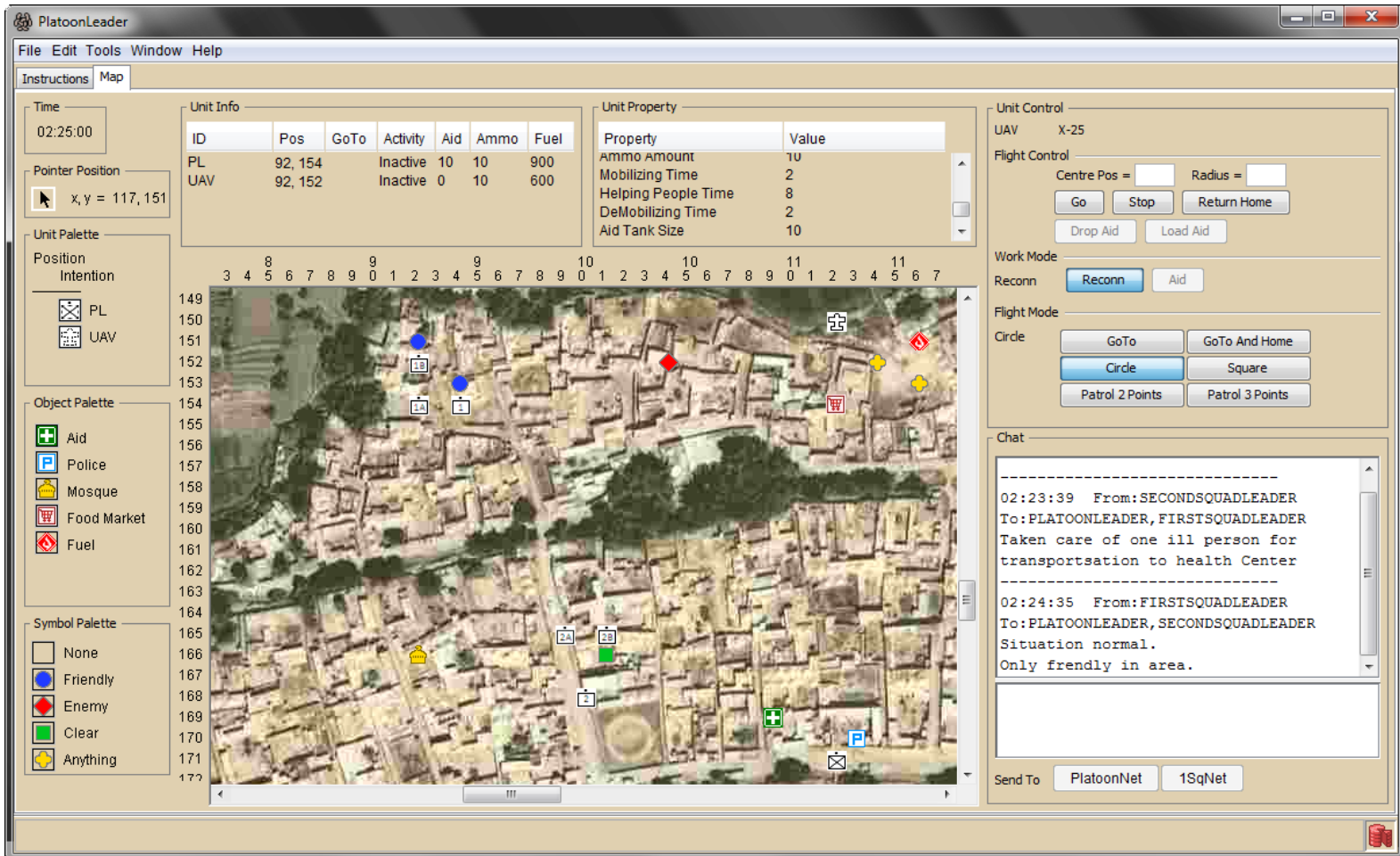
C<sup>3</sup> = Command, Control and Communication

[www.c3fire.org](http://www.c3fire.org)

# Goals

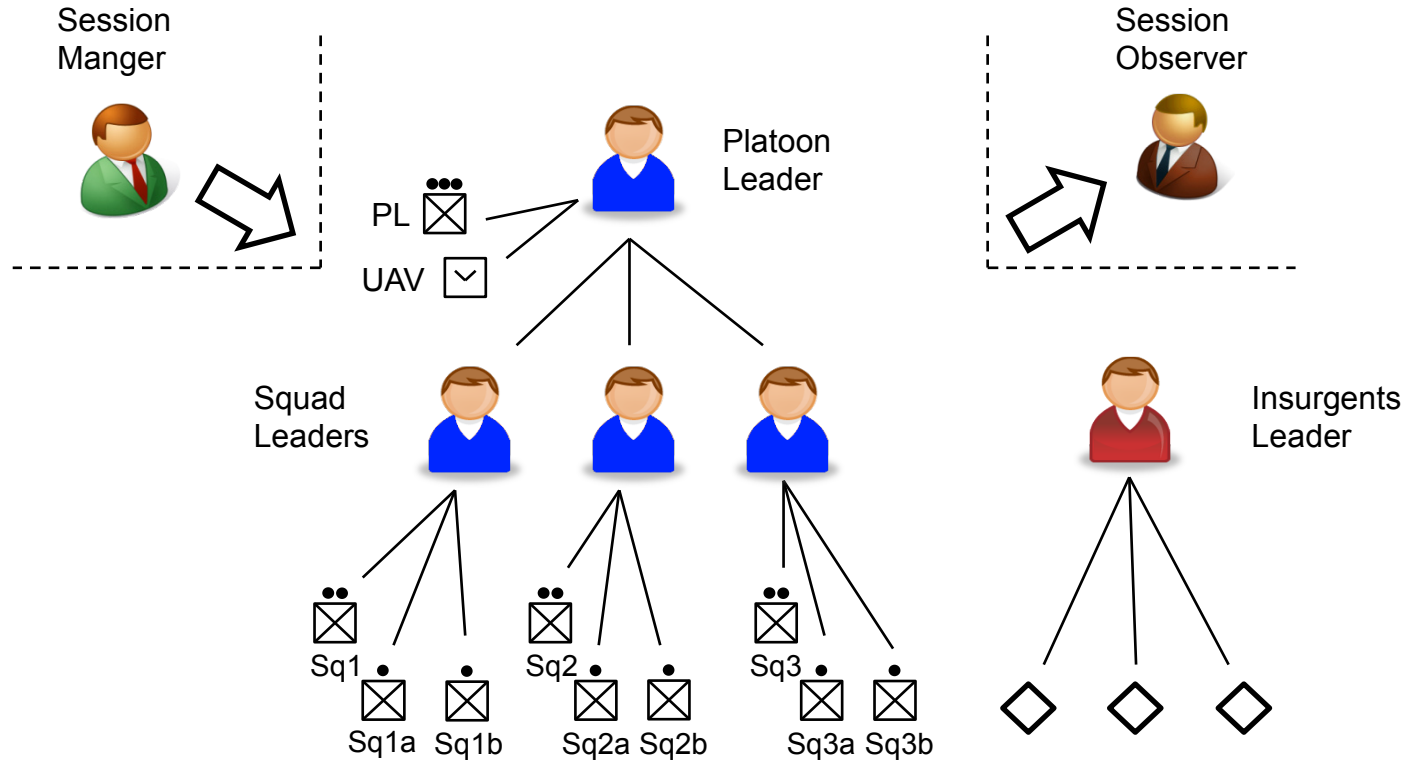
- Simulation Model
  - Transformation of a real world system into a small and well-controlled system that retains the important characteristics of the real world system.
- Tasks
  - Distributed planning
  - Coordinated actions
  - Communications
  - Team work and decision making

# User Interface - Example



North of "Camp Northern Lights" a Swedish base in Afghanistan

# Organization Example



# Tasks in the Simulation

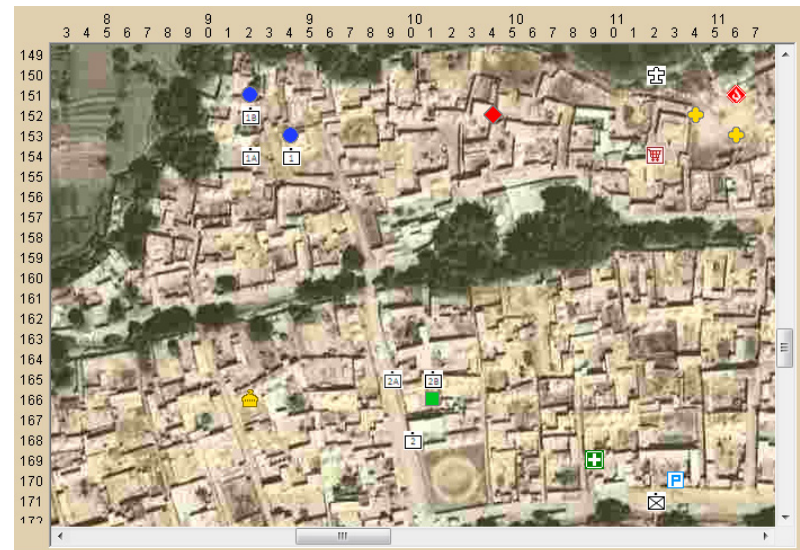
## Tasks that can be performed in the simulation

### Friendly Force

- **Reconnaissance:** The friendly force can patrol the area.
- **Create Trust:** The friendly force develop a relationship of trust between the civilians and the friendly force. When the civilians have trust in the friendly force, the insurgents can no longer create the mistrust that makes the civilians hostile to the friendly force.
- **Give Aid:** The friendly force can give aid to the civilians. The aid can turn angry civilians into neutral bystanders or develop trust between neutral civilians and the friendly force.
- **Evacuation:** The friendly force can transport civilians from one location to another. A common mission in our experiments is to achieve the goal of transporting ill or wounded (hostile, neutral, and/or trusting) civilians to a health center.
- **Find and destroy:** The friendly force can destroy the insurgents.
- **Transport:** Units or convoys that transport resources such as aid, fuel, or ammunition.

### Insurgents

- **Agitate:** The insurgents can make the civilians angry and lead them to mistrust the friendly force.
- **Find and destroy:** The insurgents can kill the friendly forces.



# The Players' Tasks

The players in C3Conflict are presented a number of different problems. They must:

- **Understand their task and the environment**  
They needs to understand the properties of the resources and organization, they needs to understand behavior of the environment, make prognoses concerning the future development in the environment, and define action alternatives.
- **Engage in goal analysis**  
They needs to identifying priorities among goals, identifying sub-goals, resolving conflicting goals.
- **Work as a team**  
They needs to understand their role and tasks in the team, understand the others needs, understand the importance of sharing information in a proper manner.
- **Make decisions**  
They needs to interact with the team and consider and evaluate their own strategies, over time.

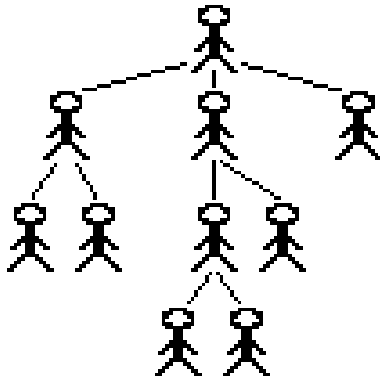
# Pitfalls in the Task

## Typical problems that players have in the C3Conflict environment are

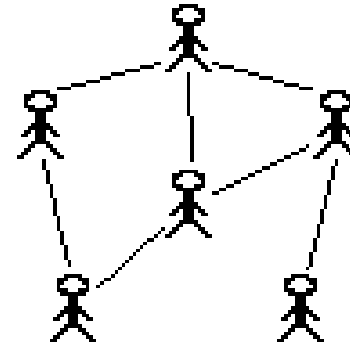
- **Ad hoc behavior**  
They can adopt an ad hoc behavior.
- **Thematic vagabonding**  
They can adopt a thematic vagabonding behavior. The error of thematic vagabonding occurs when attempts to control a system or situation have no structure. Participants jump from one topic to the next without analyzing the result.
- **Attention tunneling**  
They can adopt an attention tunneling behavior. This refers to a single-minded focus on one approach to solve the problem to the exclusion of all others approaches. The narrowness of vision often precludes achievement of an overall view of the problem.
- **Side effects**  
They do not understand the side effects of their actions.
- **Delayed feedback**  
They have problems with delayed feedback.



# Session Definition



Hierarchic organization



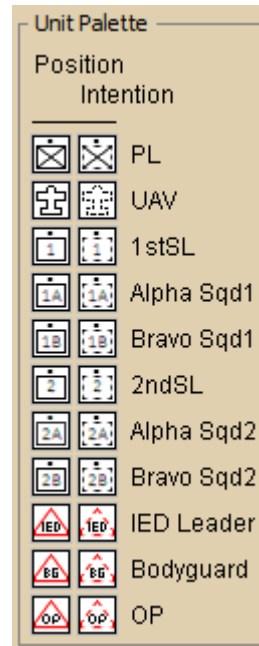
Flat (net work based) organization

- Players
- Resources
- Communication, chat groups, etc.
- Symbol based communication in the map system

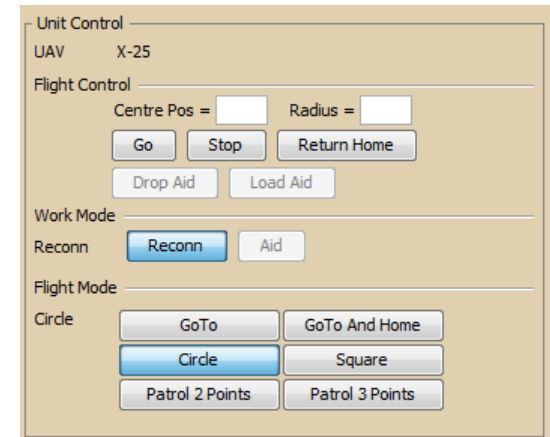
# Resorces

## Definition of units

- Reconnaissance
- Create Trust
- Give Aid
- Evacuation
- Find and destroy
- Transport
- Agitate



Symbols in the map



Control Panel – Example UAV






# World definitions

Object Palette

-  Aid
-  Police
-  Mosque
-  Food Market
-  Fuel

Objects

Symbol Palette

-  None
-  Friendly
-  Enemy
-  Clear
-  Anything

Symbol based Communication

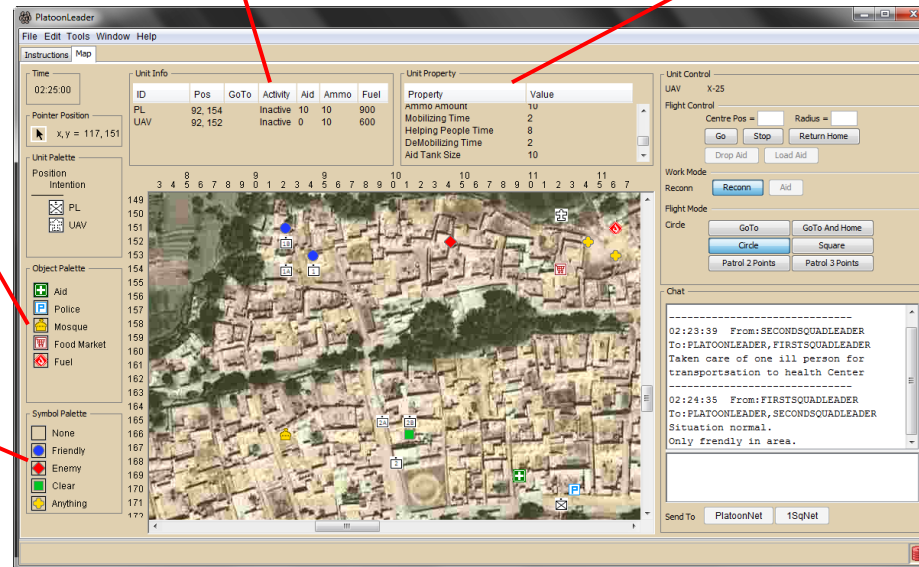
Unit Info

| ID         | Pos          | GoTo | Activity | Aid | Ammo | Fuel |
|------------|--------------|------|----------|-----|------|------|
| PL         | 112, 97      |      | Inactive | 10  | 10   | 900  |
| UAV        | 112, 97      |      | Inactive | 0   | 10   | 600  |
| 1stSL      | 94, 154      |      | Inactive | 10  | 10   | 900  |
| Alpha Sqd1 | 92, 154      |      | Inactive | 10  | 10   | 900  |
| Alpha Sqd2 | 99, 165 0, 0 |      | Inactive | 10  | 10   | 900  |

Unit Property

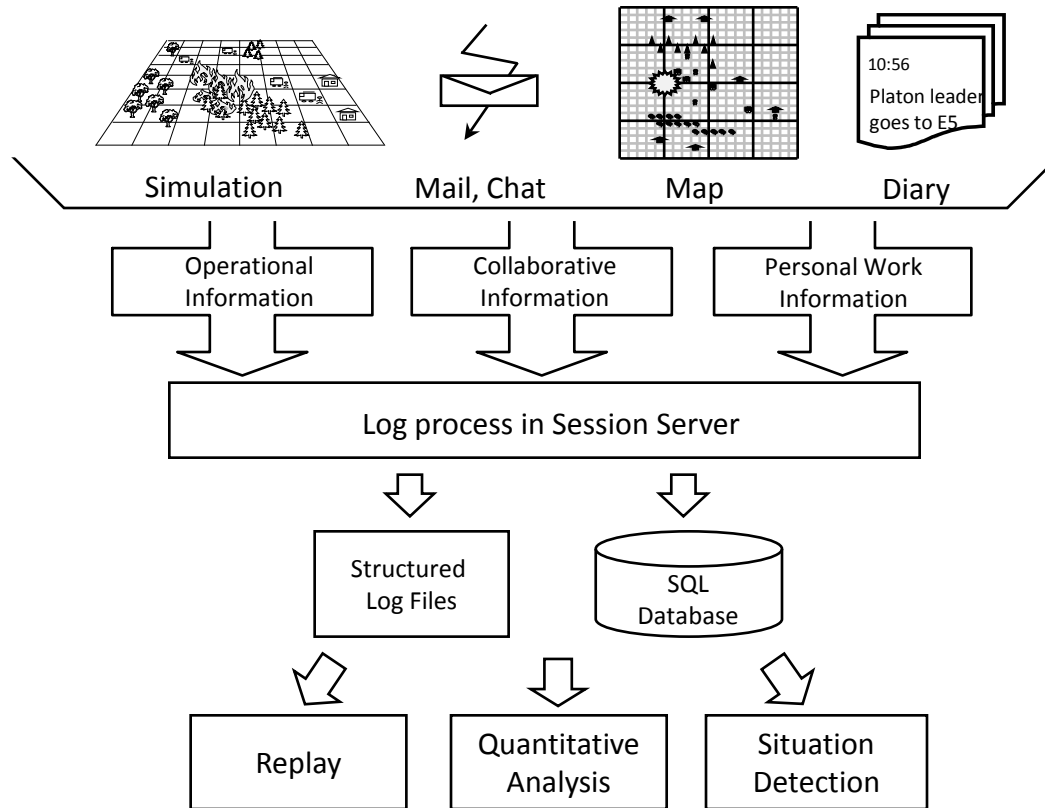
| Property            | Value |
|---------------------|-------|
| Ammo Amount         | 10    |
| Mobilizing Time     | 2     |
| Helping People Time | 8     |
| DeMobilizing Time   | 2     |
| Aid Tank Size       | 10    |

Unit Properties



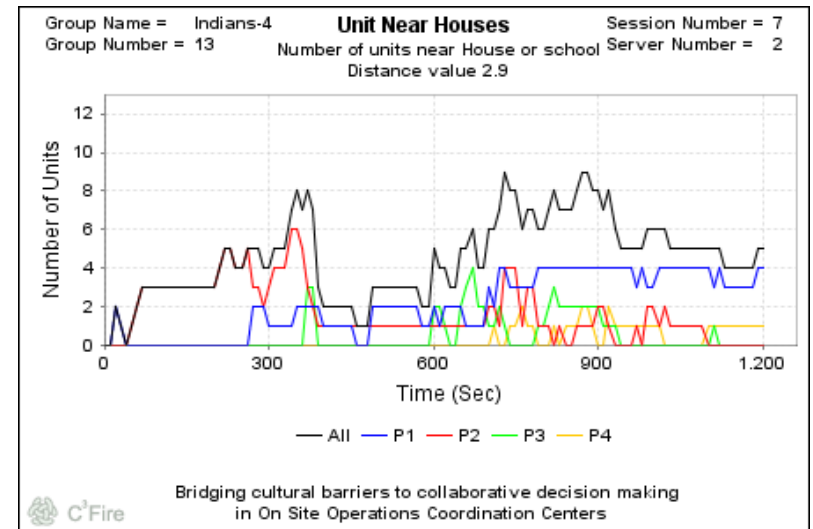
The screenshot shows the PlatoonLeader application window. It features a central map with various icons representing units and objects. On the left, there are palettes for objects and symbols. On the right, there are control panels for unit properties and flight control. The unit info and unit property tables are overlaid on the top of the map area.

# Monitoring



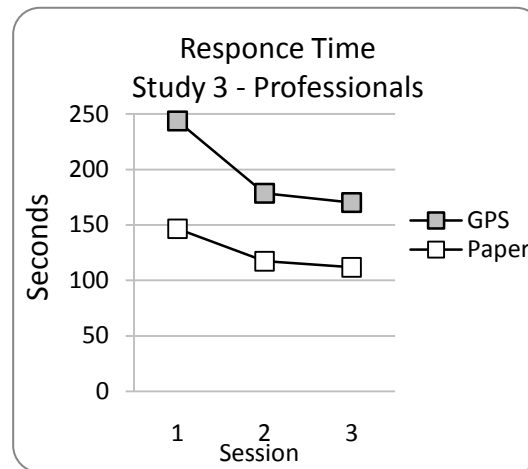
# Behavioral indicators

- Goals, strategies
- Work and collaboration processes
- Communication
- Commands to the simulation
- Simulation Data



# Behavioral metrics

## Behavioral metrics example from research with C3Fire



Granlund, R., and Granlund, H. (2011).

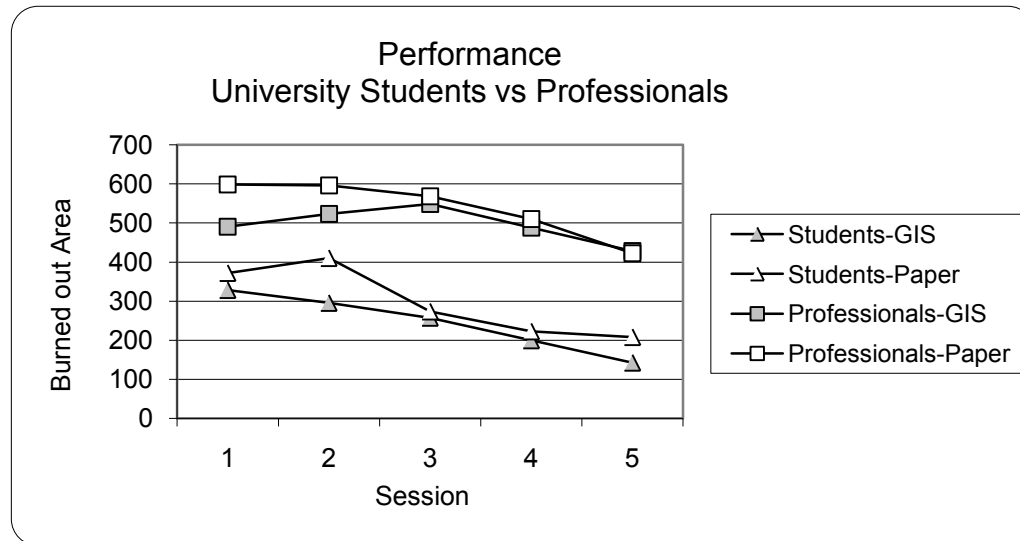
GPS Impact on Performance and Response Time – A review of Three Studies.

ISCRAM2011, 8th International Conference on Information Systems for Crisis Response and Management.

Lisbon, Portugal, May 8-11, 2011.

# Performance

Performance example from research with C3Fire



Granlund, R., Granlund, H., & Dahlbäck, N. (2011a).

Differences between Students and Professionals While Using a GPS based GIS in an Emergency Response Study. In 14th International Conference on Human-Computer Interaction. 9-14 July 2011, Orlando, USA.

# Communication

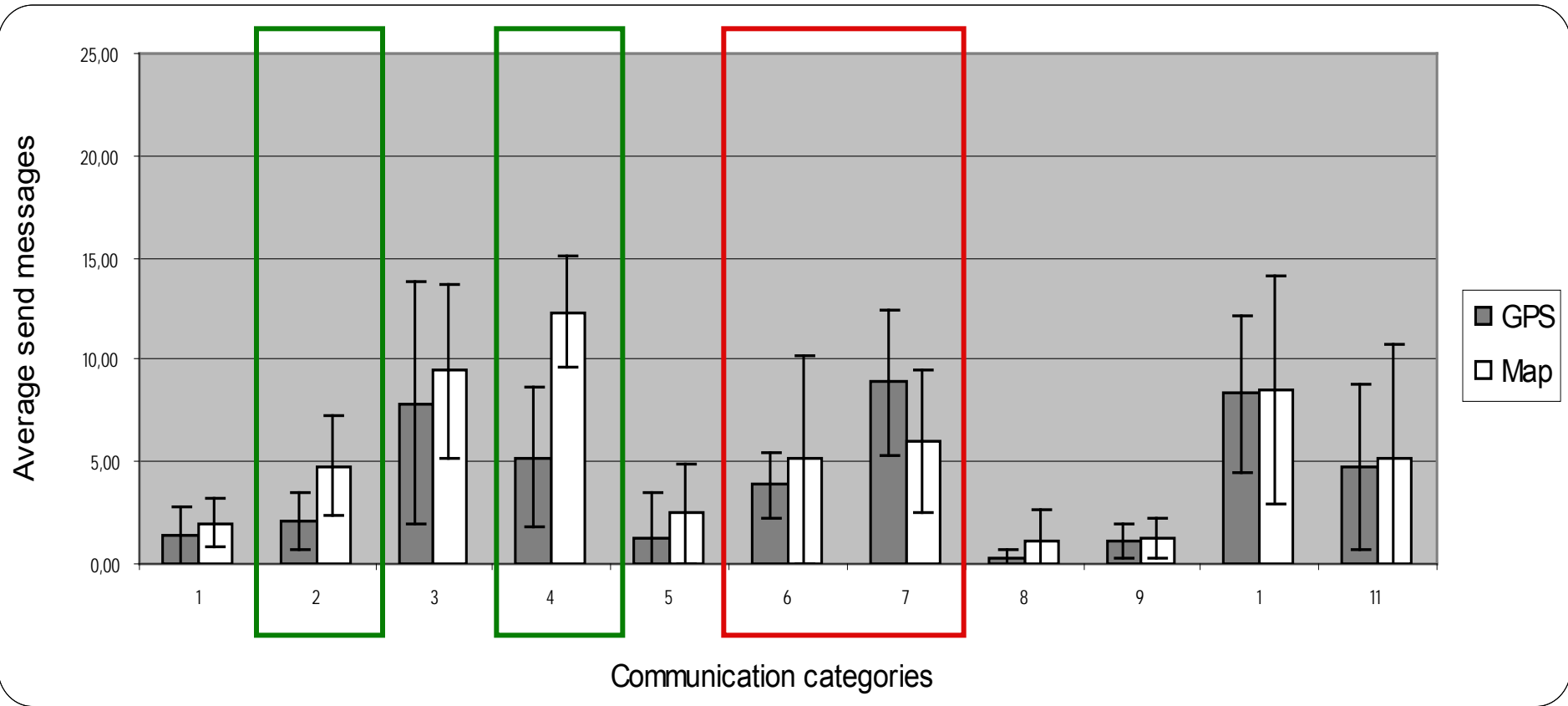
Performance example from research with C3Fire

| <i>Question</i>   |                                     | <i>Information</i> |                           |                                     | <i>Order</i>         |                     | <i>Other</i>            |                                  |  |                      |
|-------------------|-------------------------------------|--------------------|---------------------------|-------------------------------------|----------------------|---------------------|-------------------------|----------------------------------|--|----------------------|
| 1                 | 2                                   | 3                  | 4                         | 5                                   | 6                    | 7                   | 8                       | 9                                | 10                                     | 11                   |
| <i>About Fire</i> | <i>About other persons activity</i> | <i>About Fire</i>  | <i>About own activity</i> | <i>About other persons activity</i> | <i>Mission order</i> | <i>Direct order</i> | <i>Request for help</i> | <i>Request for clarification</i> | <i>Acknowledgment on info or order</i> | <i>Miscellaneous</i> |

Granlund, H., Granlund, R., & Dahlbäck, N. (2011).  
 The Impact of GPS Support on the Performance of Municipal Crisis Management Teams.  
 At ICCRTS2011, the International Command and Control Research and Technology Symposium.  
 21-23 June 2010, Quebec, Canada.



# Communication



**Information about own Activity, 4**  
**Questions about other persons Activity, 2**

**Mission order, 6**  
**Direct order, 7**

# Questions

Contact

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