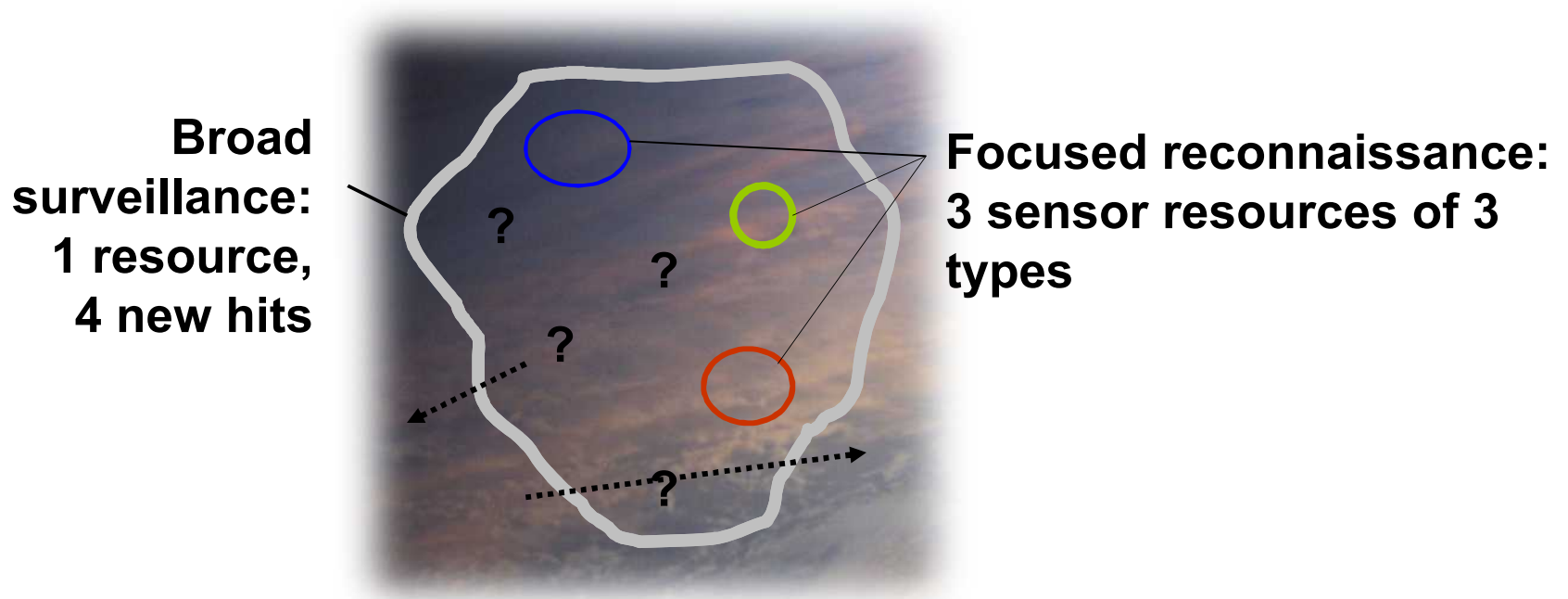


# Sensors, Plans and Situations

**Project: Collaborative Situational Awareness in Network-Centric Warfare**

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**Problem:** Advanced sensors detect more ambiguous, fleeting energy sources than can be fully sampled



How do you choose when:

- Your team controls only one resource
- Each team speaks a different technical language
- You have an unknown time to act, probably minutes

Most sensor systems are designed to execute independent, *a priori* plans, not adapt to ambiguous situations at the ***speed of need***

# Approach: Empirically study live, cross-cultural sensor operations to understand collaborative situational awareness and reasoning



A pilot at Nellis Air Force Base, in Las Vegas, maneuvers a Predator in a mission on the other side of the globe.

Different spectra  
Different systems  
Different concepts  
Different jargons  
Different priorities



The Global Hawk ground station at Edwards AFB, Calif. Located in a dark, high-tech trailer, the pilot sits to the right side while the sensor operator occupies the empty workstation in the foreground.



NAVAL INSTITUTE PHOTO ARCHIVE (ANDREW MEYERS)

Face-to-Face  
Voice loops  
Text chat  
Conferencing



NAVAL INSTITUTE PHOTO ARCHIVE (GARY BONACCORSO)



# Hypothesis: Ops dialogue is a psycholinguistic computation and control mechanism for sensor systems

## What it does for sensor systems

Dynamically adapts sensitivity and selectivity to context

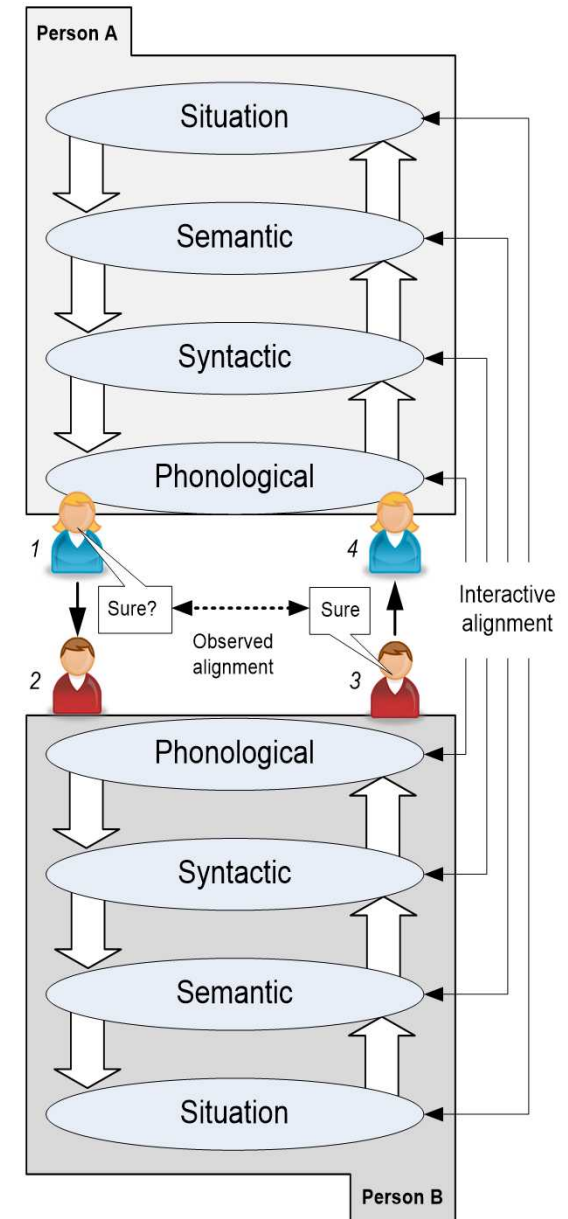
Avoids algorithmically correct but situationally inappropriate system states

## How the mechanism works

Crews create linguistic common ground between cultures that is sociable and non-hierarchical

Exploits “meaningful imprecision” of natural languages, particularly prepositional phrases: near, during, with, etc.

Thinking aloud, opinions, hedging to reason about ambiguous situations and adapt



# Results:

Psycholinguistic mechanisms have been observed, analyzed, and documented, laying a foundation for improved sensor decision support systems

Case studies are scientific yet accessible to crews, managers, engineers, and policy makers

# **Significance:**

Analyses have been widely read and discussed inside the work domain

## **Known applications:**

- Crew training and CONOP development
- Operations floor redesign project
- Operationally Responsive Space (ORS) program: training in cross-cultural operations
- Office of the Director of National Intelligence (ODNI): collaboration training and policy development

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