

# Counter-Deception Decision Support

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# Problem

- **Denial and deception (D&D) aims to:**
  - disrupt one's ability to “observe, orient, and decide”
  - induce inaccurate impressions about capabilities or intentions, causing the target to
    - apply intelligence assets inappropriately
    - fail to employ capabilities to best advantage
- **Most proposed counter-deception solutions**
  - make no use of the psychology of deception and decision making
  - attempt to reason from evidence to hypotheses

# Background

## *Finding the Dots*

*Whaley & Busby: Congruity Theory & Ombudsman Method*

## *Characterizing the Dots*

*R. V. Jones: Theory of Spoof Unmasking*

## *Connecting the Dots*

*Heuer: Analysis of Competing Hypotheses*

## *Seeing the Pictures*

*Johnson et al.: Cognitive Model of Fraud and Deception Detection*

- Components of a theory of counter-deception exist.
- We will integrate them.

# Objective

## ■ Combine

- psychological theories of
  - decision making errors and biases
  - deception
  - cognitive tasks involved in counter-deception
- planning and belief management technology

## ■ A counter-deception decision support system

# Activities

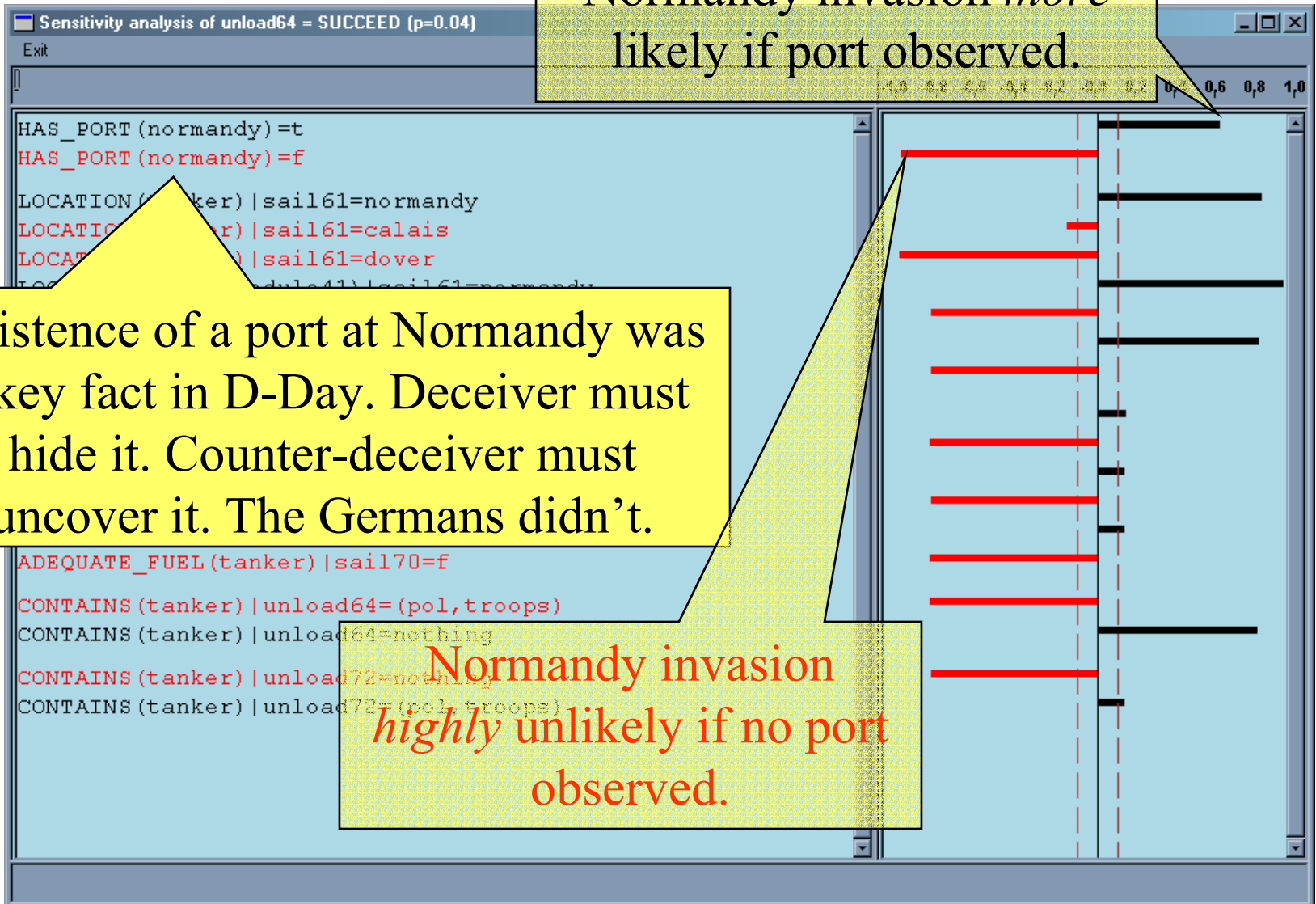
- **Year 1: Modeling**
  - Integrate:
    - Research on cognitive limits and biases
    - Deception taxonomy and models
    - Counter-deception cognitive models
- **Year 2: Create computational infrastructure**
  - Automated planning
  - Belief management
- **Year 3: Deception decision support system**
  - Experimental verification
  - Refine theory and tools

# Highlight

Normandy invasion *more* likely if port observed.

Existence of a port at Normandy was a key fact in D-Day. Deceiver must hide it. Counter-deceiver must uncover it. The Germans didn't.

Normandy invasion *highly* unlikely if no port observed.



# Demonstration

## Heuer's Eight Step Analysis of Competing Hypotheses (ACH)

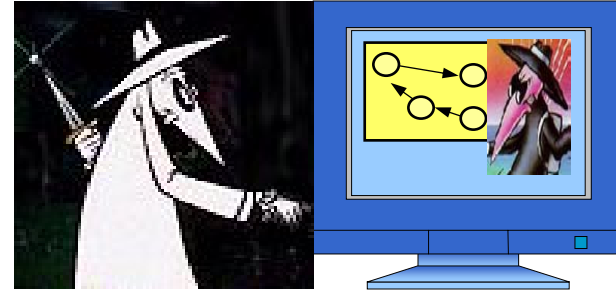
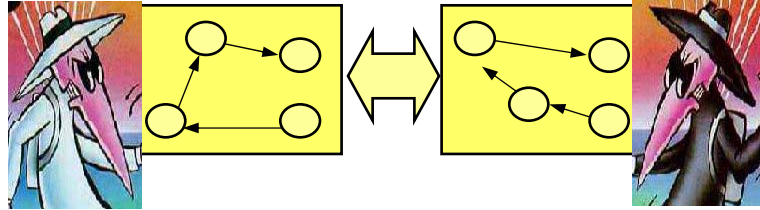
1. *Identify the possible hypotheses to be considered.*
2. *List the significant observed evidence and assumptions for and against each hypothesis.*
3. *Prepare a matrix with hypotheses across the top and evidence down the side.*
4. *Refine the matrix.*
5. *Draw tentative conclusions about the relative likelihood of each hypothesis.*
6. *Analyze sensitivity of the conclusion to a few critical items of evidence.*
7. *Report conclusions.*
8. *Identify milestones for future observation that may indicate events are taking a different course than expected.*

**Sources:** Richards J. Heuer, Jr., *Psychology of Intelligence Analysis*. Washington: Central Intelligence Agency Center for the Study of Intelligence, 1999; and MITRE MSR.

# Impacts

- **Knowledge capture and dissemination:**
  - **Psychology of Deception lectures at Sherman Kent School**
  - **Briefing to Foreign Denial & Deception Research Committee technology symposium**
- **Information operations potential:**
  - **Deception planning support system**
  - **“Red team” attack planning**
- **Treasury and DHS potential:**
  - **Fraud detection,**
  - **counter-smuggling and contraband operations**
  - **counterterrorism**

# Future Plans



- **Modeling**
  - Paper on unification of four theories into a theory of counter-deception
- **Tool development**
  - Deception planning, counter-deception analysis
- **Experimentation**
  - Test ability to reliably generate and recognize deceptions