



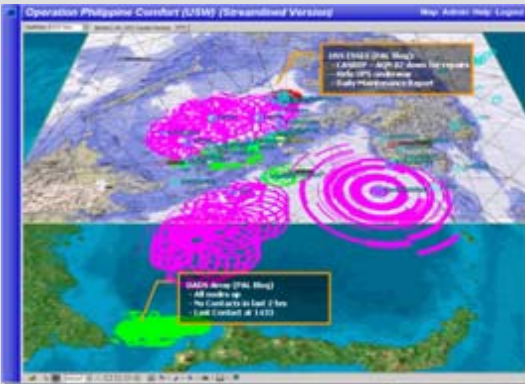
# PAL Boot Camp: Preparing Cognitive Assistants for Deployment

**Doug Lange**  
**Michael Carlin**  
**Valdis Berzins**  
**Luqi**  
**Volodymyr Ivanchenko**

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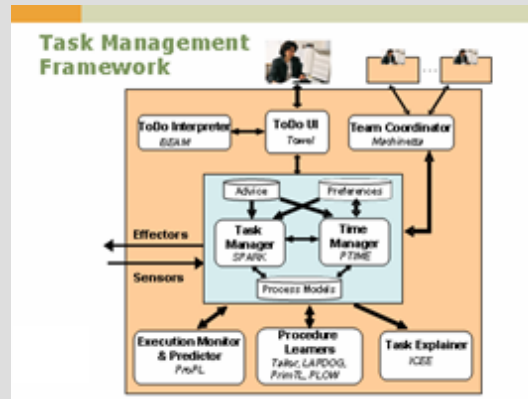
Approved for Public Distribution

## Information Management



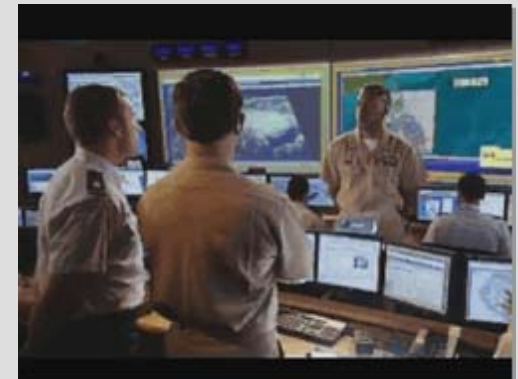
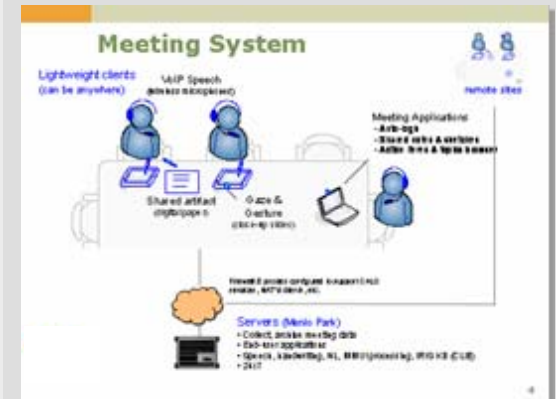
STRATCOM SKIWeb  
 Army Knowledge On-Line  
 Navy Marine Corp Internet

## Task Management & Execution



Command Post of the Future (CPOF)

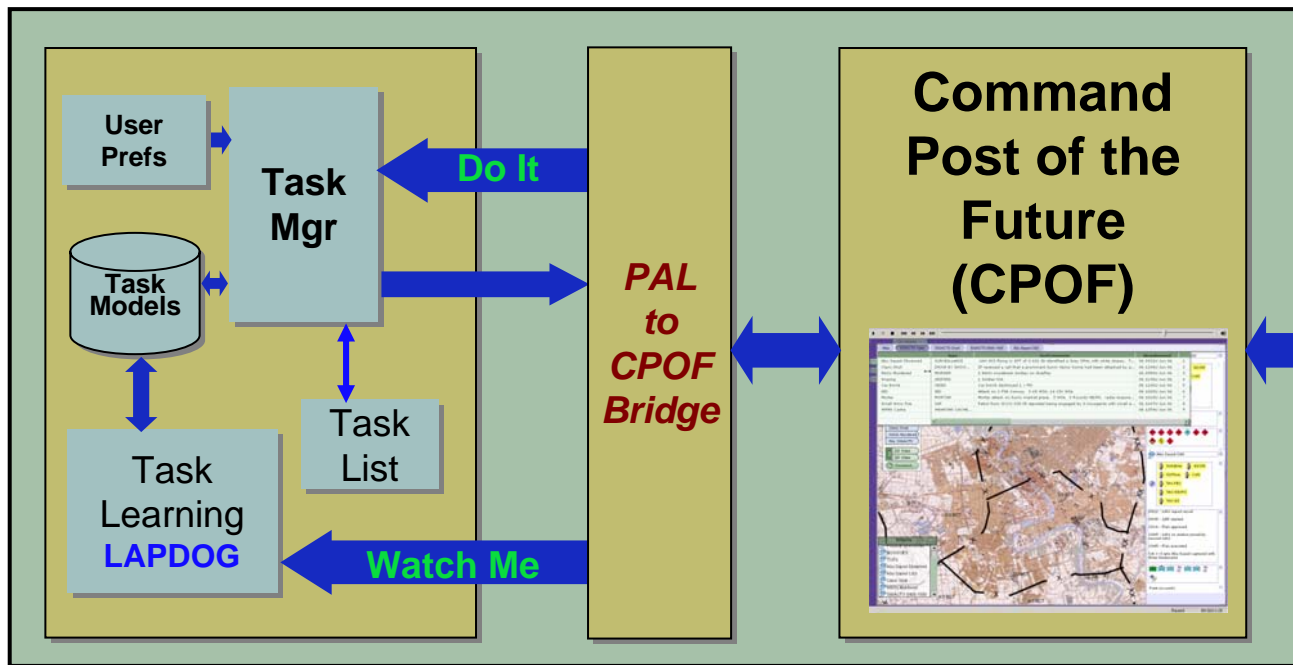
## Meeting Understanding



ATO Coordination Assistant

# PAL-Enhanced CPOF

## PAL-CPOF **Watch-Me** System

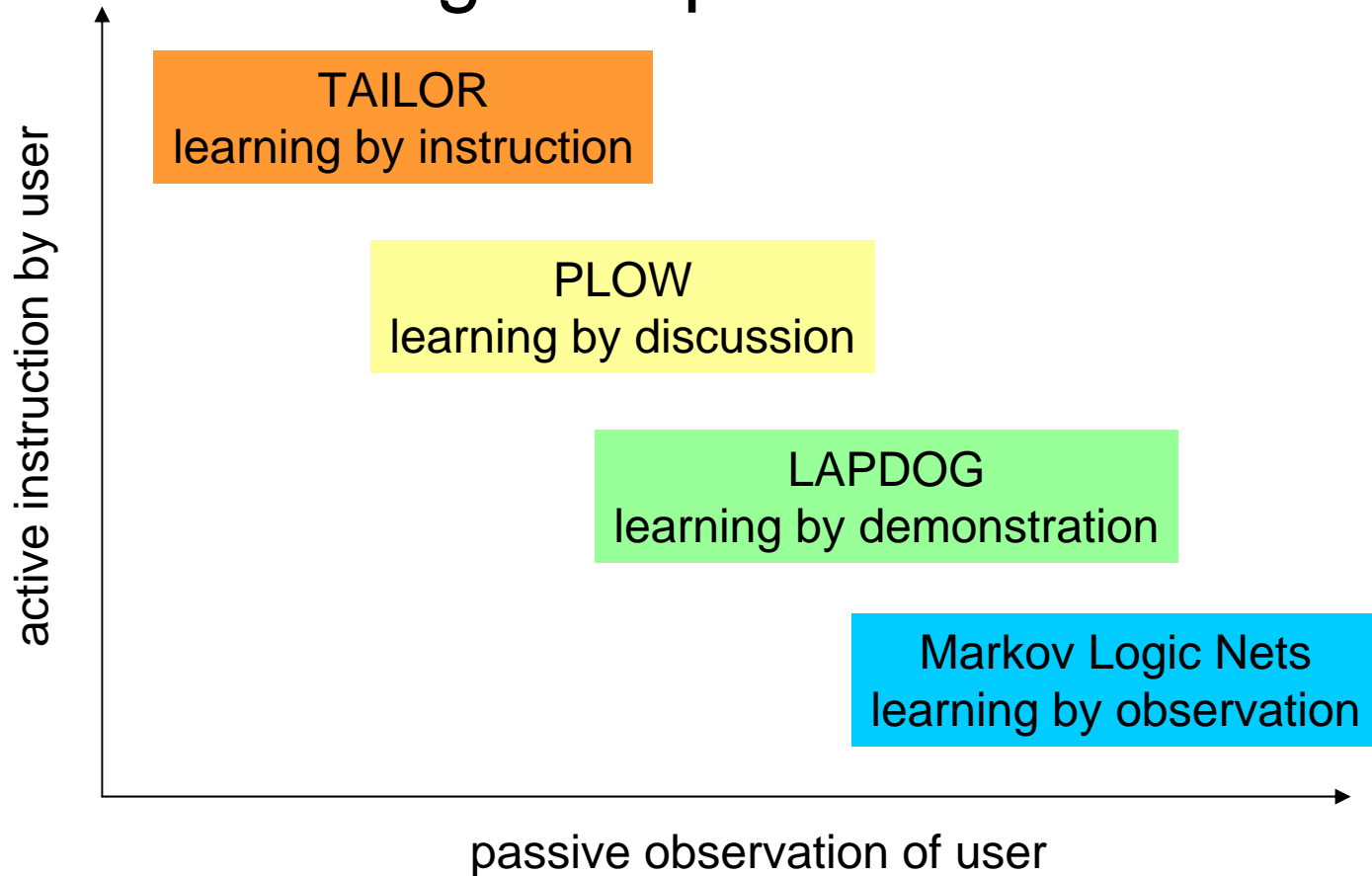


- **CALO Task Learning Subsystem**
  - CALO Task Manager
  - LAPDOG Task Learning Component
- **Interfaced to CPOF**
  - PAL components connected to CPOF through PAL-to-CPOF bridge (developed with GD Viz)
- **CPOF Users ask PAL to learn new procedures by observation**

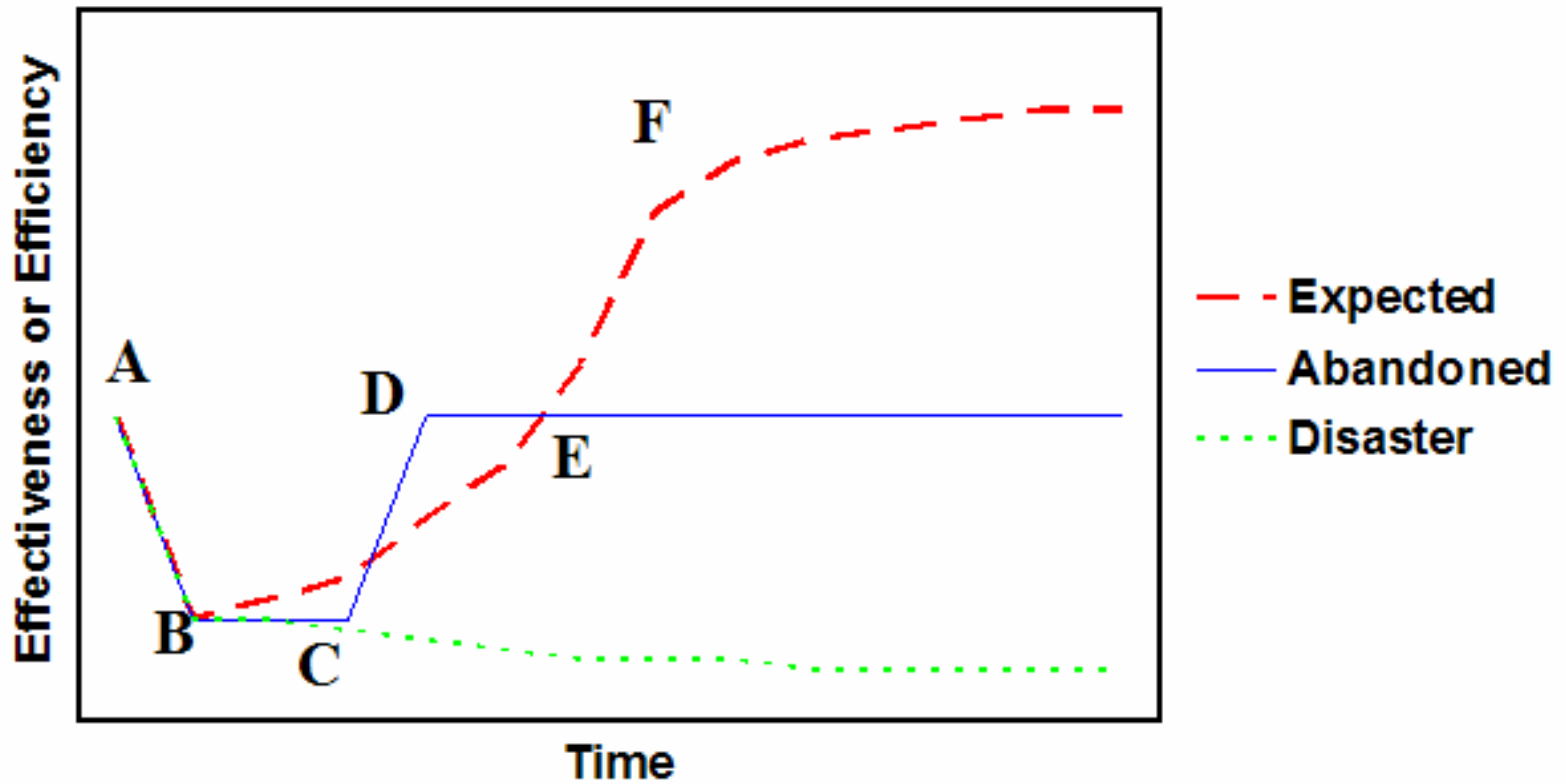
### Demonstrated at Ft. Stewart OCT 2006

“Based on my experiences and what I saw during the demo, PAL could be an incredibly powerful tool for Tactical Operations Center (TOC) operations. It has the potential to save countless man-hours by conducting routine, repetitive tasks with little or no input from the user. Those man-hours could then be reallocated to other tasks (analysis, rest, etc) or even free up Soldiers to conduct combat operations.” -- *CAPT Daniel Kent, Battle Captain, 3ID*

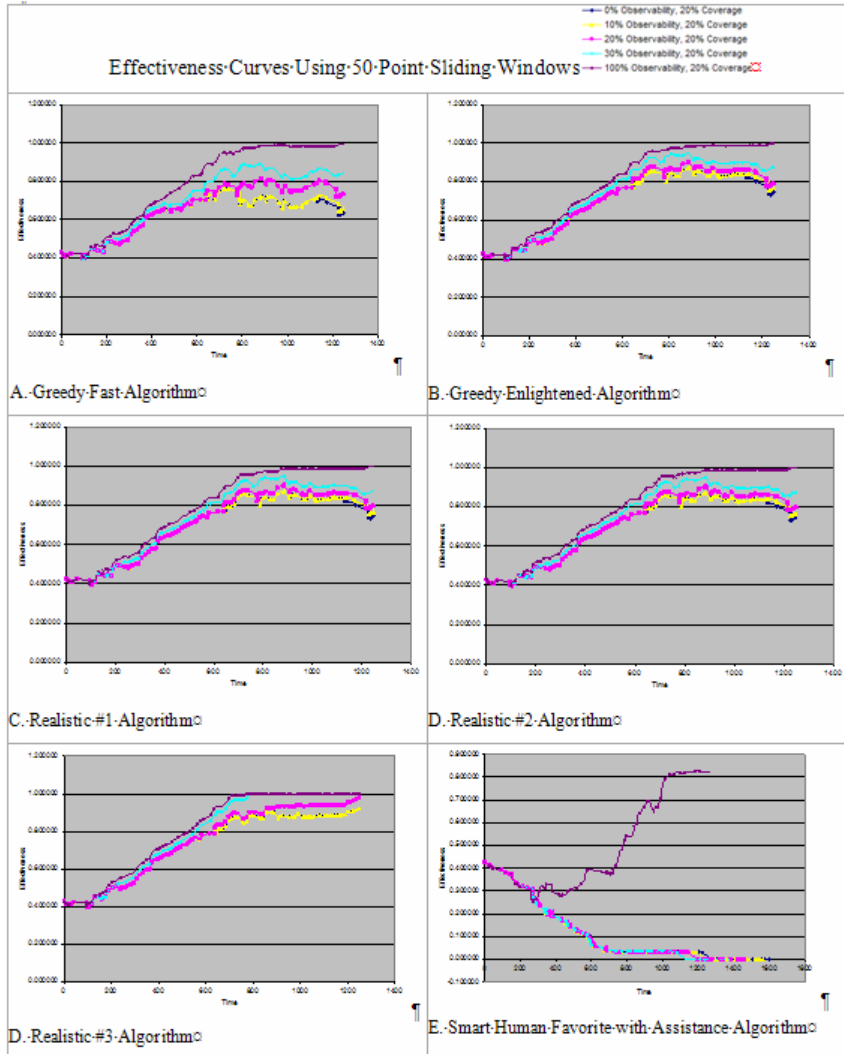
# Learning Composite Tasks



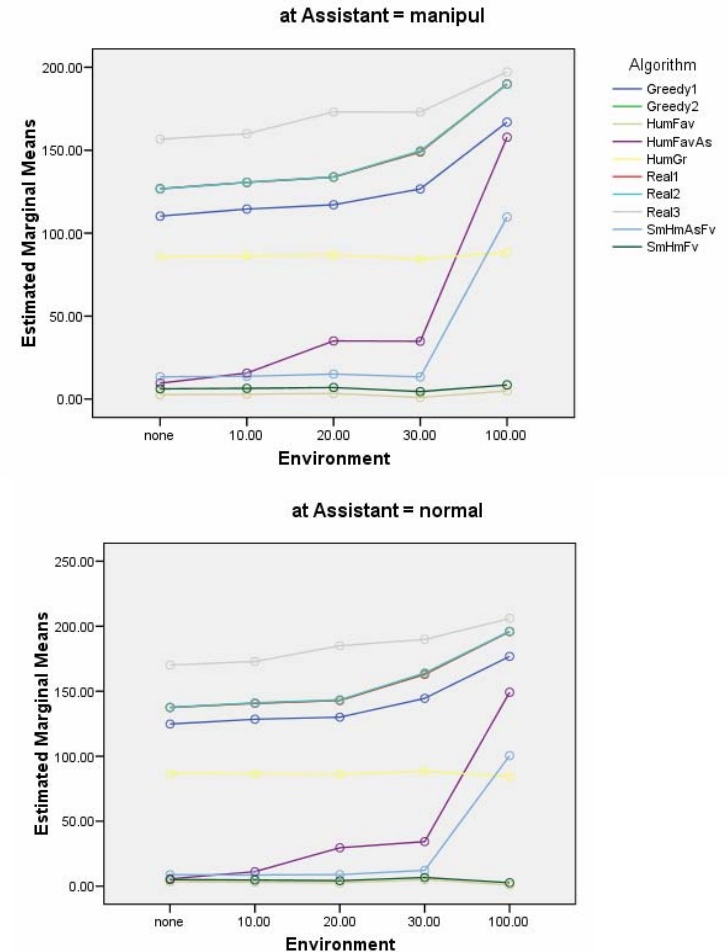
# Three Possible Outcomes for Effectiveness and Efficiency



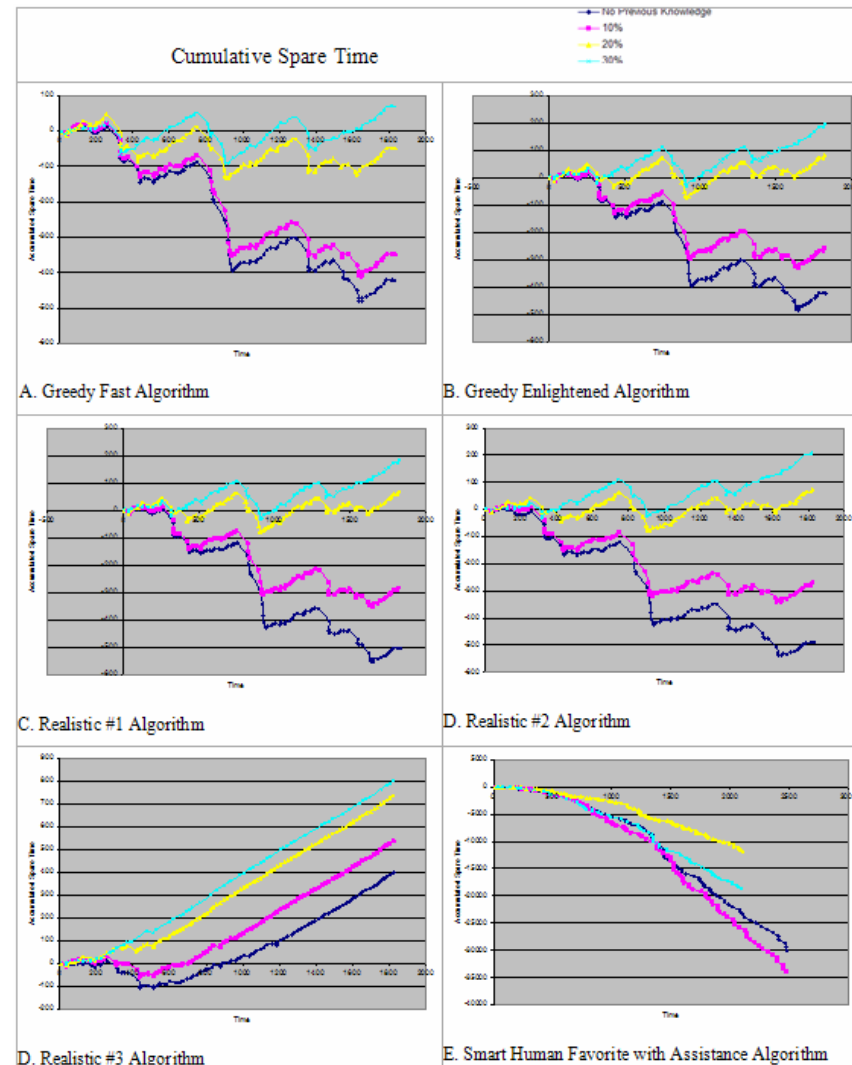
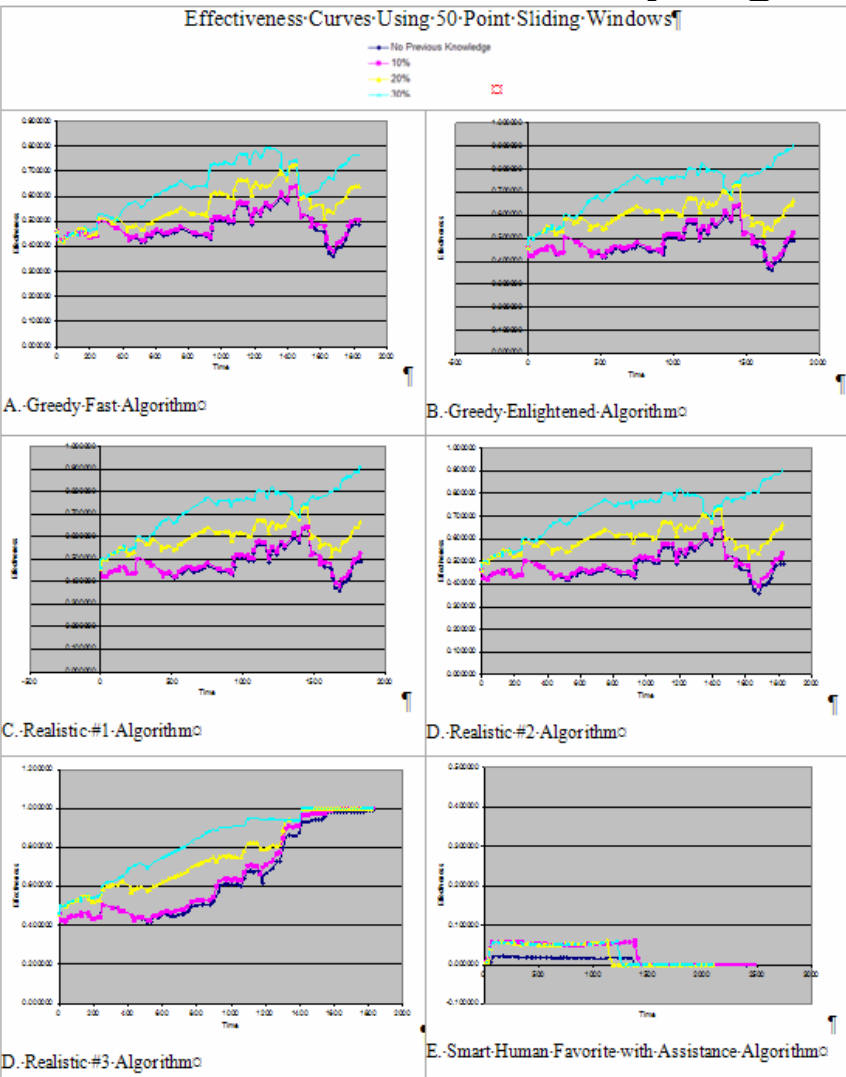
# Effectiveness over Observability Rates



Estimated Marginal Means of Reward

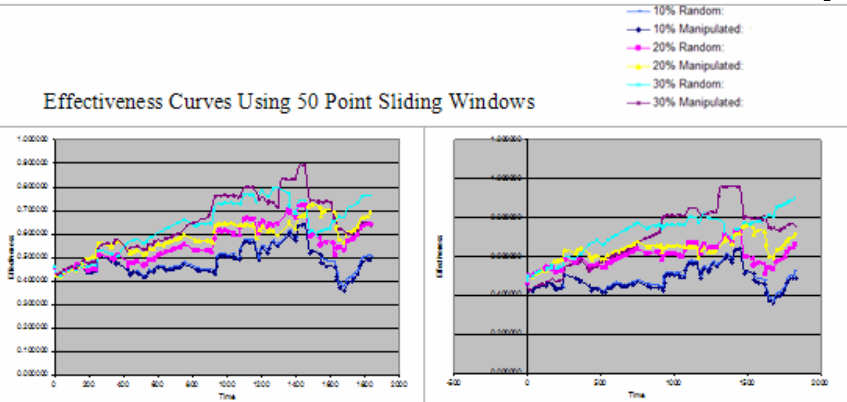


# Effectiveness and Efficiency over Varying Training Amounts



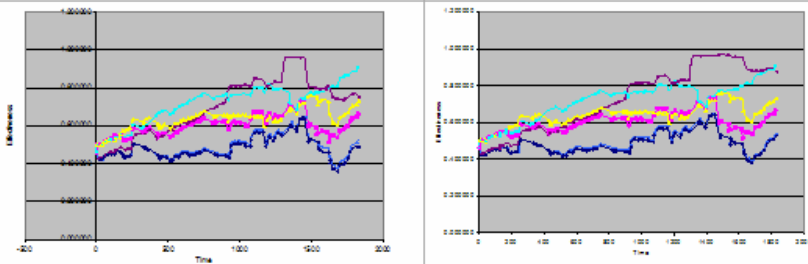
# Effectiveness and Efficiency over Different Preparation Strategies

Effectiveness Curves Using 50 Point Sliding Windows



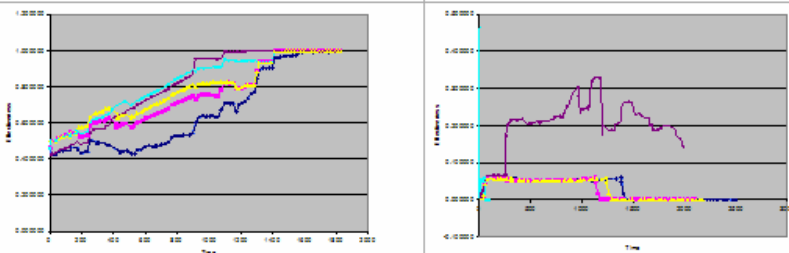
A. Greedy Fast Algorithm

B. Greedy Enlightened Algorithm



C. Realistic #1 Algorithm

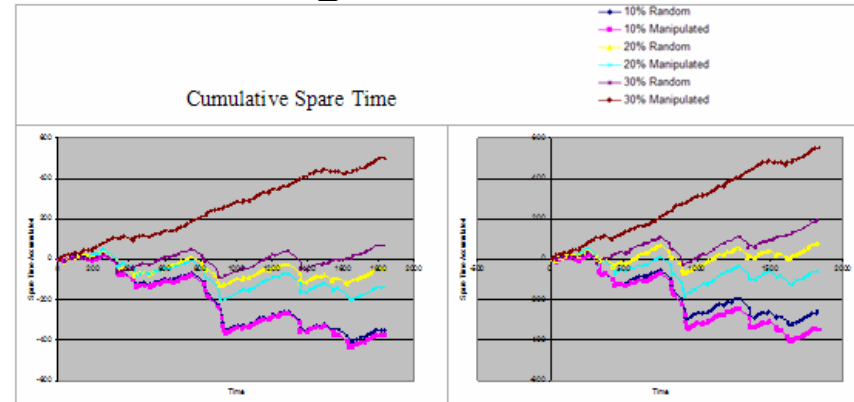
D. Realistic #2 Algorithm



D. Realistic #3 Algorithm

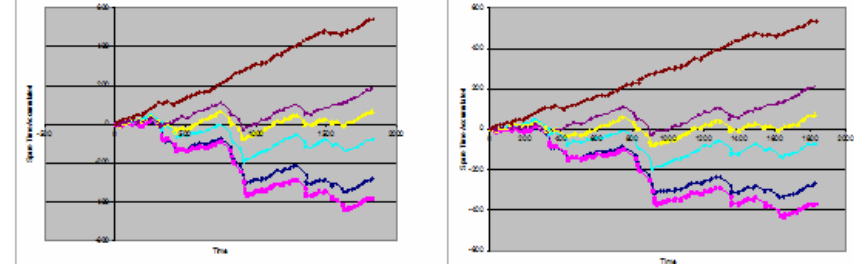
E. Smart Human Favorite with Assistance Algorithm

Cumulative Spare Time



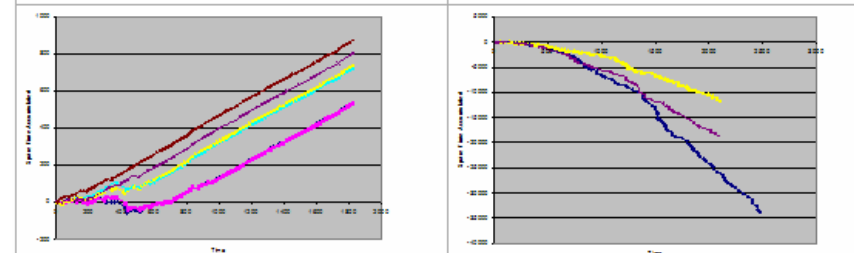
A. Greedy Fast Algorithm

B. Greedy Enlightened Algorithm



C. Realistic #1 Algorithm

D. Realistic #2 Algorithm

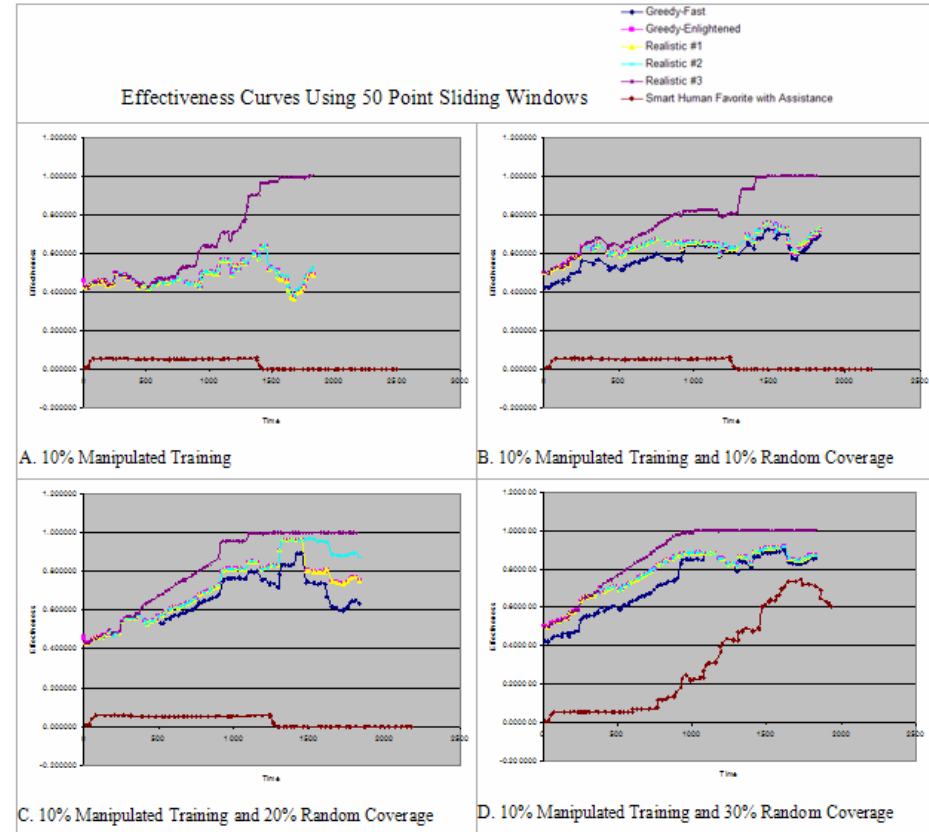
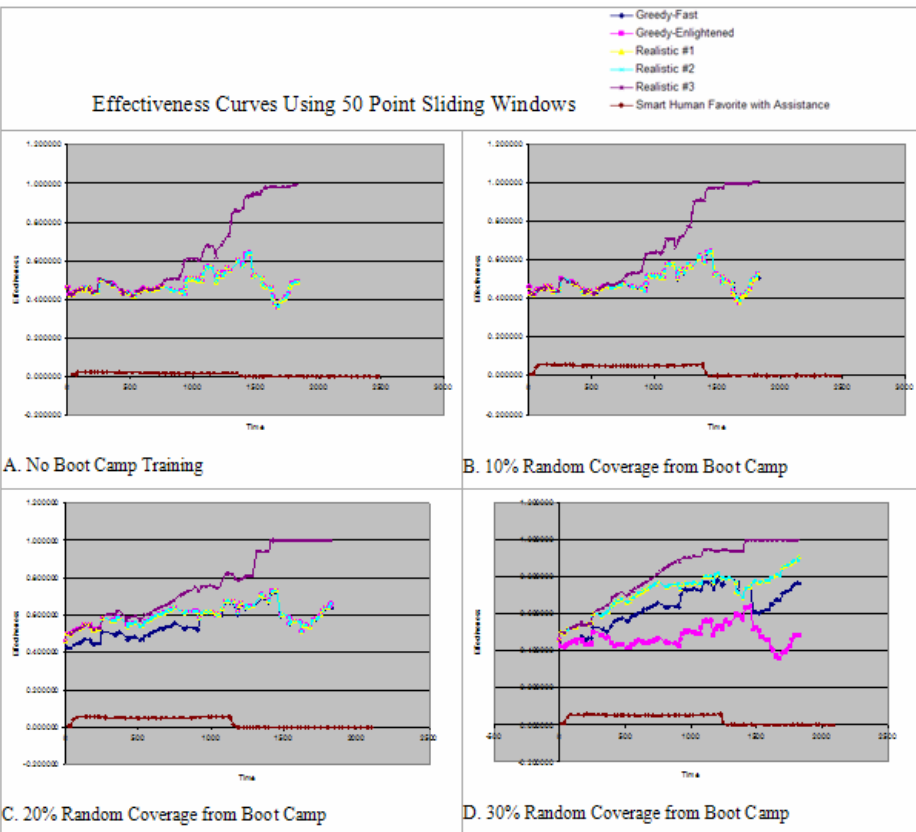


D. Realistic #3 Algorithm

E. Smart Human Favorite with Assistance Algorithm



# Effectiveness over Different Human Use Strategies



## Conclusions

- As expected, more training is better than less training.
- What wasn't expected was the lack of value of focused training.
- Observability is significant factor once around 30%.
- Human use strategy is critical.

# The Navy's Center of Excellence for C4ISR

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