Update on Herbal and Applications

Frank E. Ritter[1], Steven R. Haynes[1],
Mark Cohen[1,2], Thomas Kannampallil[1],
Maik Friedrich[1,3]

1-College of IST, Penn State

2-Lock Haven University

3-U. of Bamberg

frank.ritter@psu.edu shaynes@ist.psu.edu mcohen@lhup.edu
thomasg@psu.edu maik-bernd.friedrich@stud.uni-bamberg.de

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Real world behavioral modeling with the Herbal high-level language

Problem

- Low-level cognitive models are difficult to create, use, re-use, and comprehend
- Development environments do not support models for real world uses

Objectives

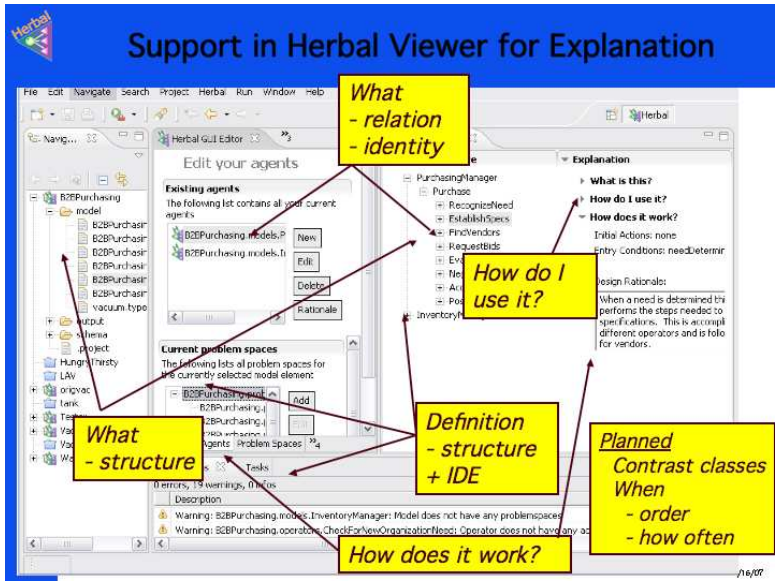
- Create a use-centric cognitive modeling environment
- Support high-level agents that explain themselves
- Create realistic cognitive modeling testbeds

Herbal Accomplishments/Impact

- ~8x code expansion into Soar and Jess
- Study shows 3x faster to create
- Many types of explanations supported
- User base (12+2+40+6+8+9) provides feedback on usability, design suggestions, and associated materials (manual, tutorial, FAQ, model library)
- Real-world anti-terrorism planning environment designed
- Planned use in IED planning env.
- dTank used to explore SA and moderators
  (BRIMS'07, '08, SimTecT '08)

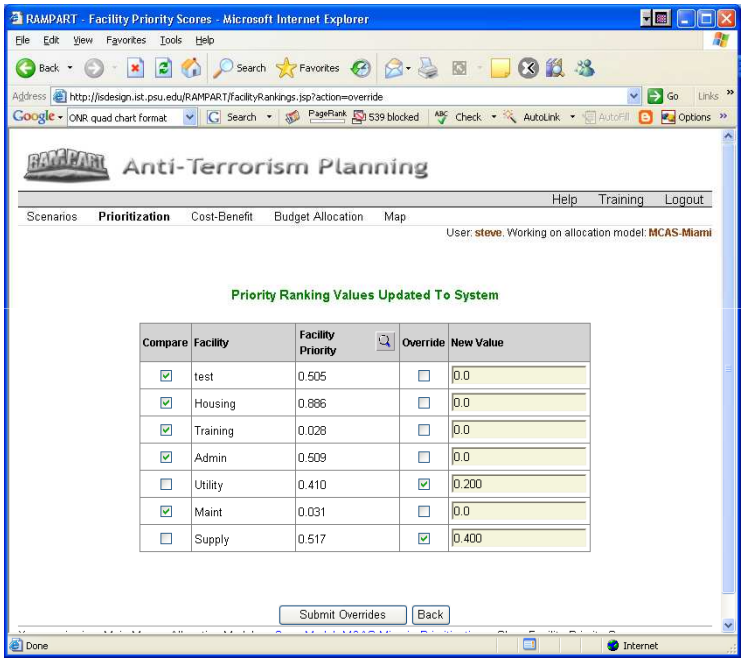
Approach

- Herbal development environment based on HCI and SE theory, and empirical studies of modelers
- Support High level constructs directly
- Use existing toolkits (Eclipse, XML)
- Create real world-scale cognitive models to support users of Rampart anti-terrorism planning tool
- Provide easy to use tactical simulation for testing



Integration with a Decision Support System

Rampart Anti-Terrorism Planning



Agents Support for Users in Rampart

- Full task analysis of the Rampart anti-terrorism planning system
- Task analysis used to create agents to notice use and support user of the system
- Initial tasks now supported and simple help provided for two tasks

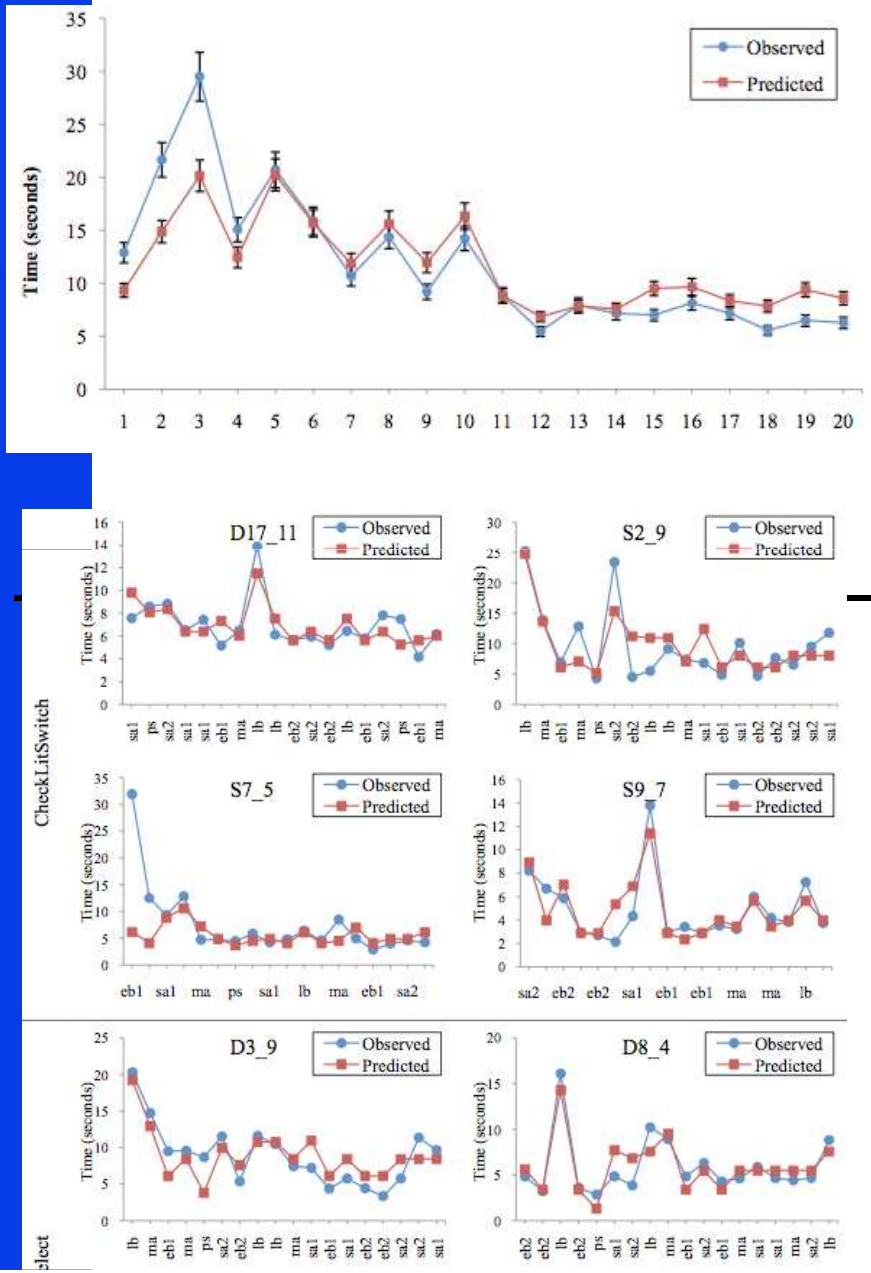
Potential Relevance

- Reduce the cost of HBM for applications in military training and OR by 50%
- Create real world-scale cognitive models to support users of Rampart anti-terrorism planning tool
- Provide usable tactical simulation for testing and OR

Future plans

- Real-world anti-terrorism planning environment deployed
- ~10x code expansion and 10x faster to create
- User base provides feedback and libraries
- Meta-reflective agents

Investigating Strategies with Herbal



OBJECTIVE

- Examine learning in the Klingon laser bank (Diag) task
- Understand strategy choice and individual differences

TECHNICAL APPROACH

- Use of Herbal/Soar (Soar 8.6)
- Use of Soar's chunking mechanism
- Implemented 4 more strategies
- Gathered new data on Diag task (N=37, US and Germany)
- Matched subjects against strategies

RESULTS

- Times of Herbal/Soar-Diag and Diag R=0.8
- Eye-tracking helped create strategies
- Wider range of strategy use found in these subjects
- Individuals were better matched by additional strategies

IMPACT

- Identification of source of individual differences in learning
- Enhanced ability to explain learning curve and differences in it

REFERENCES

- Friedrich (2008), Ritter & Bibby (2008)