

Cognitive Modeling for User Interface Design



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with



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Presented as an On-line Seminar, Feb. 28 - Mar 2, 2005



Lisa Neal, Coordinator and Moderator

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Program Officer: Susan F. Chipman, Ph.D.**



A Note on the Presentation Format

Download and view the slides as pdf files on your own computer, listen to presentation by teleconference.

Follow along with slides on your computer.

Annotate with Acrobat, or mark up hard copies with your notes.

Interact with the presenter by chat, email, and teleconference hookup.

Moderator (Lisa Neal) will handle interaction while presenters speak: you will be able to ask questions using text chat or by email, and, at the end of each unit, by telephone.

Why we are taking a relatively low-tech approach:

Web conferencing tools aren't available or don't work well in many DoD Labs.

We appreciate your feedback on the effectiveness of this approach.

After seminar is complete:

Archive of files and sound recording will be posted on the web site.

Feedback will be collected at the web site.

A suggestion on how to view the slide pdf files in Adobe Acrobat Reader:

Use the right arrow key to advance slide, left-arrow to go back.

Type Control-L to enter/leave Full Screen Mode.

Command-L for Mac.

Seminar Description

This seminar presents the current state of the art of evaluating user interface designs using models of human performance that are based on cognitive architectures. Such models can yield usability results without the delay and expense of user testing of prototypes, but because they are new and still under development, whether and how to apply them is a challenge.

This seminar will survey current theory and practice. No "how-to" of actual model construction will be presented; rather the goal is to enable a good choice of whether a modeling approach will be useful, and which type of model would be best suited to the design problem at hand.

Schedule, Topics, and Slide File Names

Day 1. Feb 28.

1a. This introduction

1a_Introduction.pdf

1b. Model-based Evaluation of User Interfaces

1b_Model_Based_Eval.pdf

Motivation, basic approaches.

Modeling system must provide psychological constraints.

Three approaches - differ in constraints, detail, when to use:

Task Networks - before detailed design.

Cognitive architectures - packaged constraints.

GOMS Models - in the "sweet spot."

1c. An Example Cognitive Architecture

1c_Example_Architecture.pdf

Use EPIC to illustrate cognitive architecture.

Should help clarify later comparisons.

1d. Walk-through of EPIC doing an example task

1d_Example_Run.pdf

Schedule continued

Day 2. Mar 1.

2a. GOMS Models as Simplified Cognitive Architectures

2a_GOMS_Architectures.pdf

Keystroke-Level Model, CPM-GOMS, NGOMSL, GOMSL/GLEAN.

Basic rationale and approach, with some examples.

Use in design of functionality.

2b. Survey of Cognitive Architecture Systems

2b_Architecture_Survey.pdf

Suitable for use in UI design, considered broadly.

Summary, pros & cons.

Compared on degree of psychological constraint.

Schedule continued

Day 3. Mar 2.

3a. Practical Issues in Cognitive Modeling for UI Design

3a_Practical_Issues.pdf

Task analysis, Generativity, Detail, Validity, Simulating the System.

Major obstacles and issues in using Cognitive Modeling.

3b. Presentation by Bonnie John: Making simple models easy: A new tool for Keystroke-Level Models

3b_CogTool