LIMBS

What is it? What does it do?
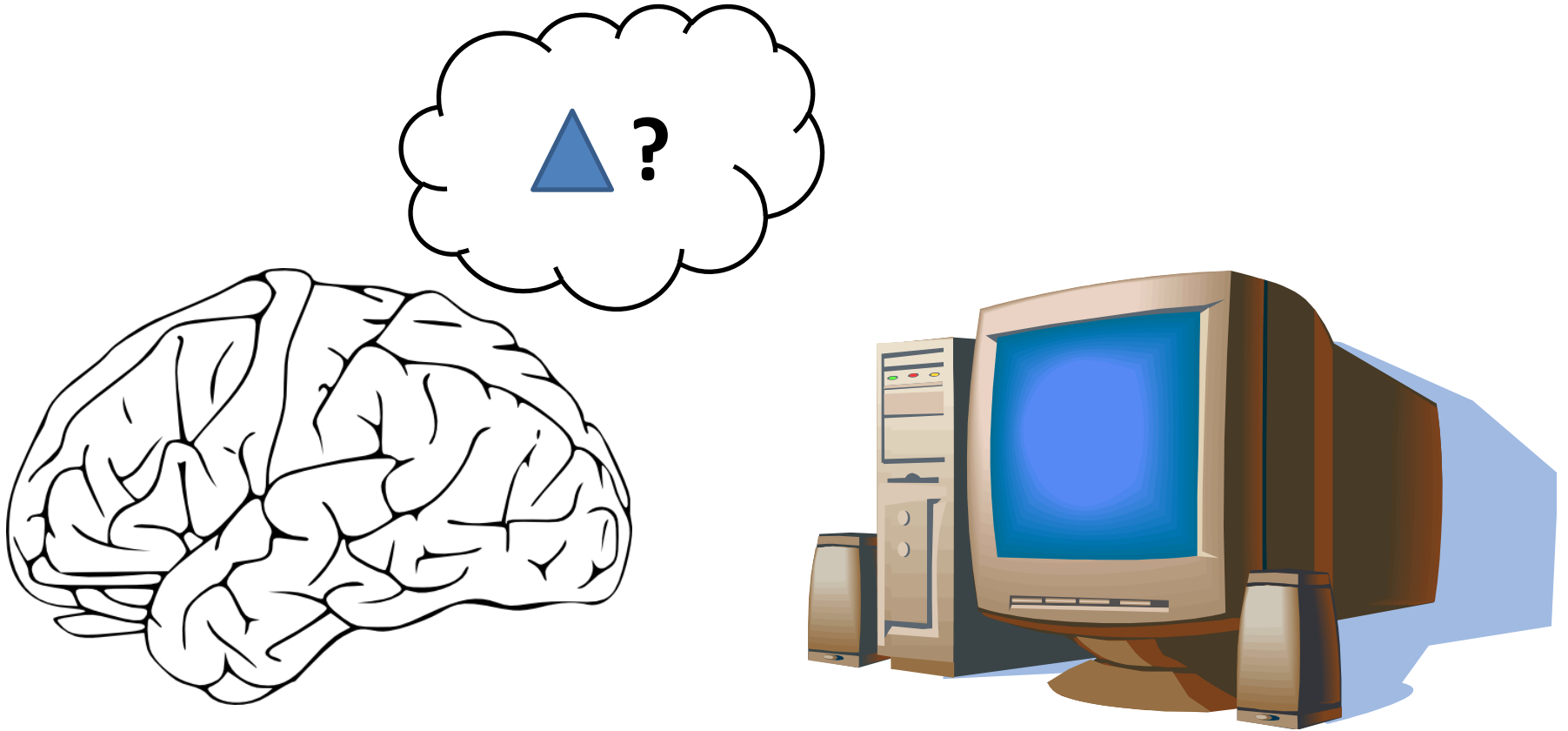
- LIMBS: Locally Integrated Multi-Brain Systems Modeling Software

- It models people – the way they interact, make decisions, and react to information within their environment

Why?

- To provide a friendly interface for users to produce socio-cognitive models, without needing to know a programming language
- To make producing complex models easier

EXAMPLE

Implementation Details

- Models consist of different types of components:
  - Agents
  - Propositions (Actions, Evidence, Goals)
  - Groups
  - Utilities (Event Scheduler, Poller, Logger)
- Agents communicate with other agents in their group about propositions in their group

Implementation Details

- Agents based on "hot coherence" paradigm to model both cognitive and emotional decision making
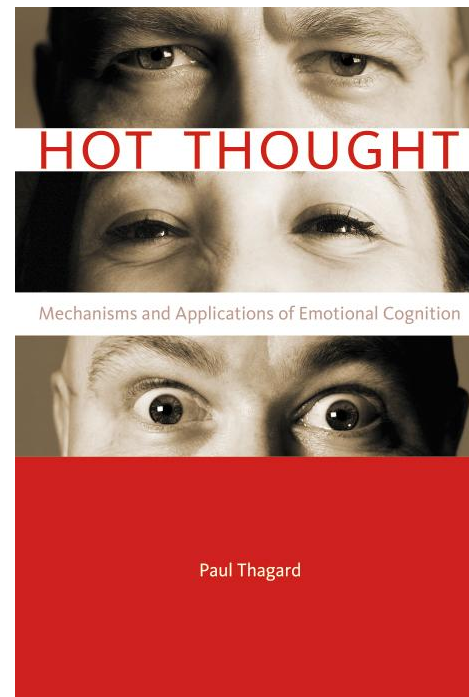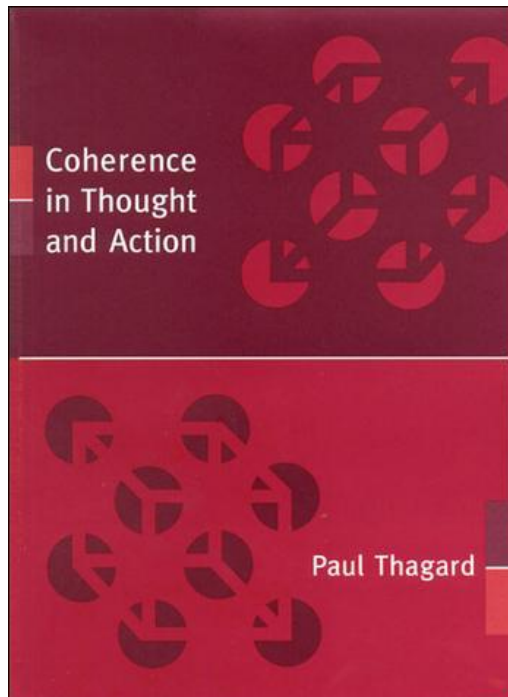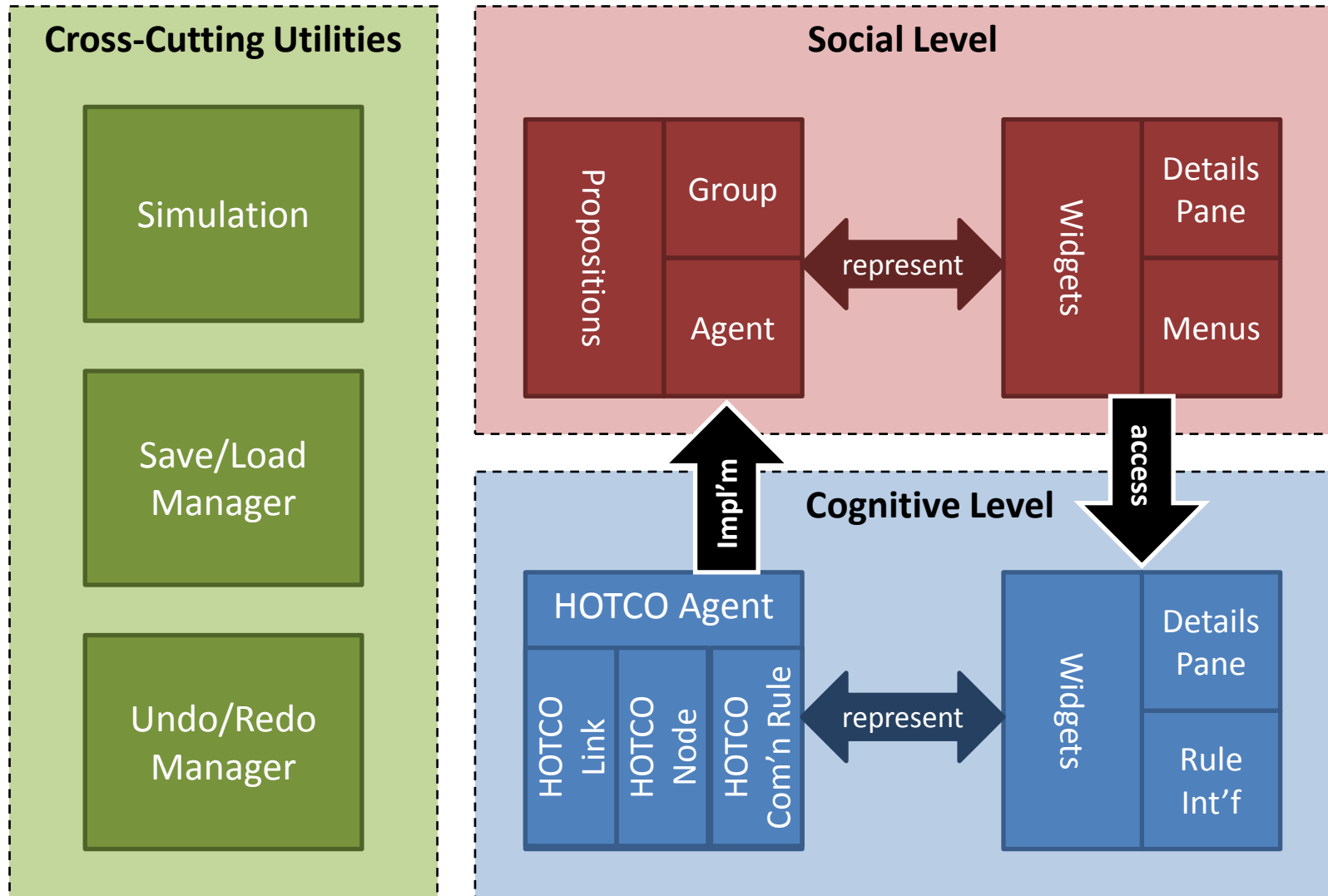
Implementation Details

- Utilities monitor or affect the model at a specific time in the simulation
  - The Event Scheduler injects external events into the simulation
  - The Poller queries agents for their "thoughts" regarding a particular subject
  - The Logger records messages in the simulation
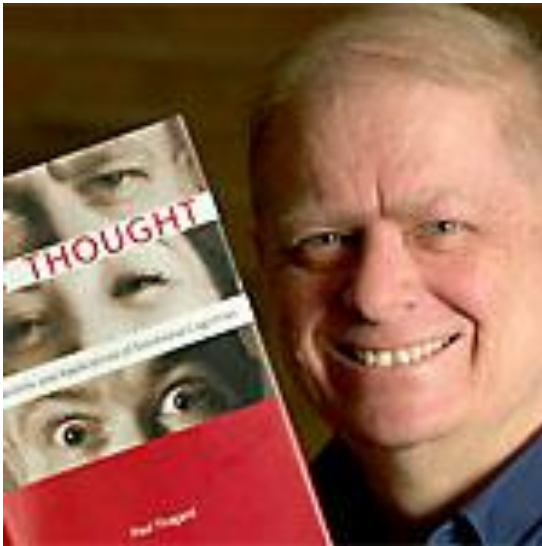
Technical Specs

System Structure

Cross-Cutting Utilities

- Simulation
- Save/Load Manager
- Undo/Redo Manager

Social Level

Propositions — Group, Agent

represent

Widgets — Details Pane, Menus

Impl'm

access

Cognitive Level

HOTCO Agent — HOTCO Link, HOTCO Node, HOTCO Com'n Rule

represent

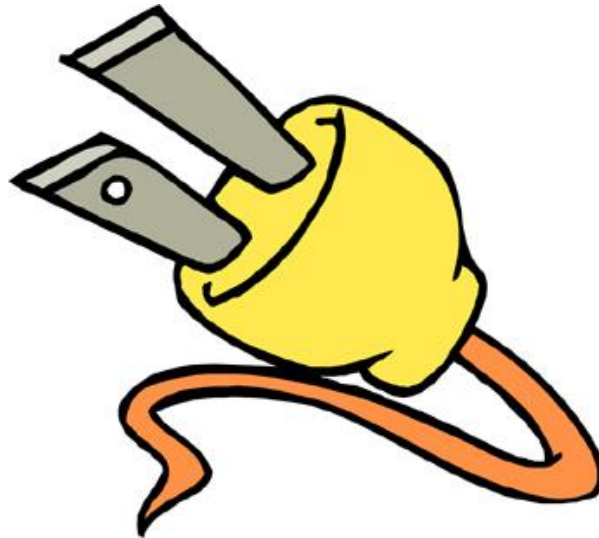Widgets — Details Pane, Rule Int'f

Design Challenges
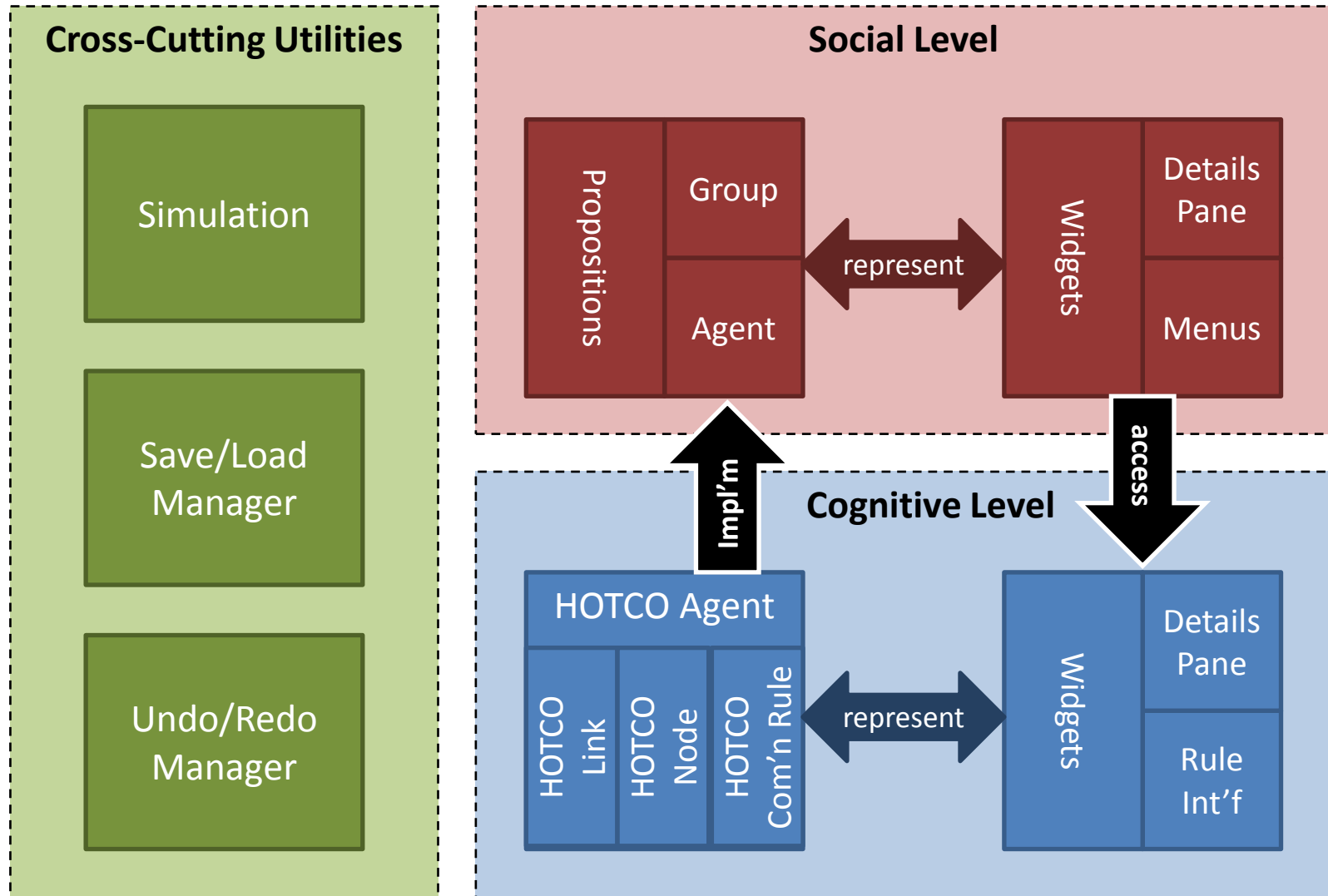
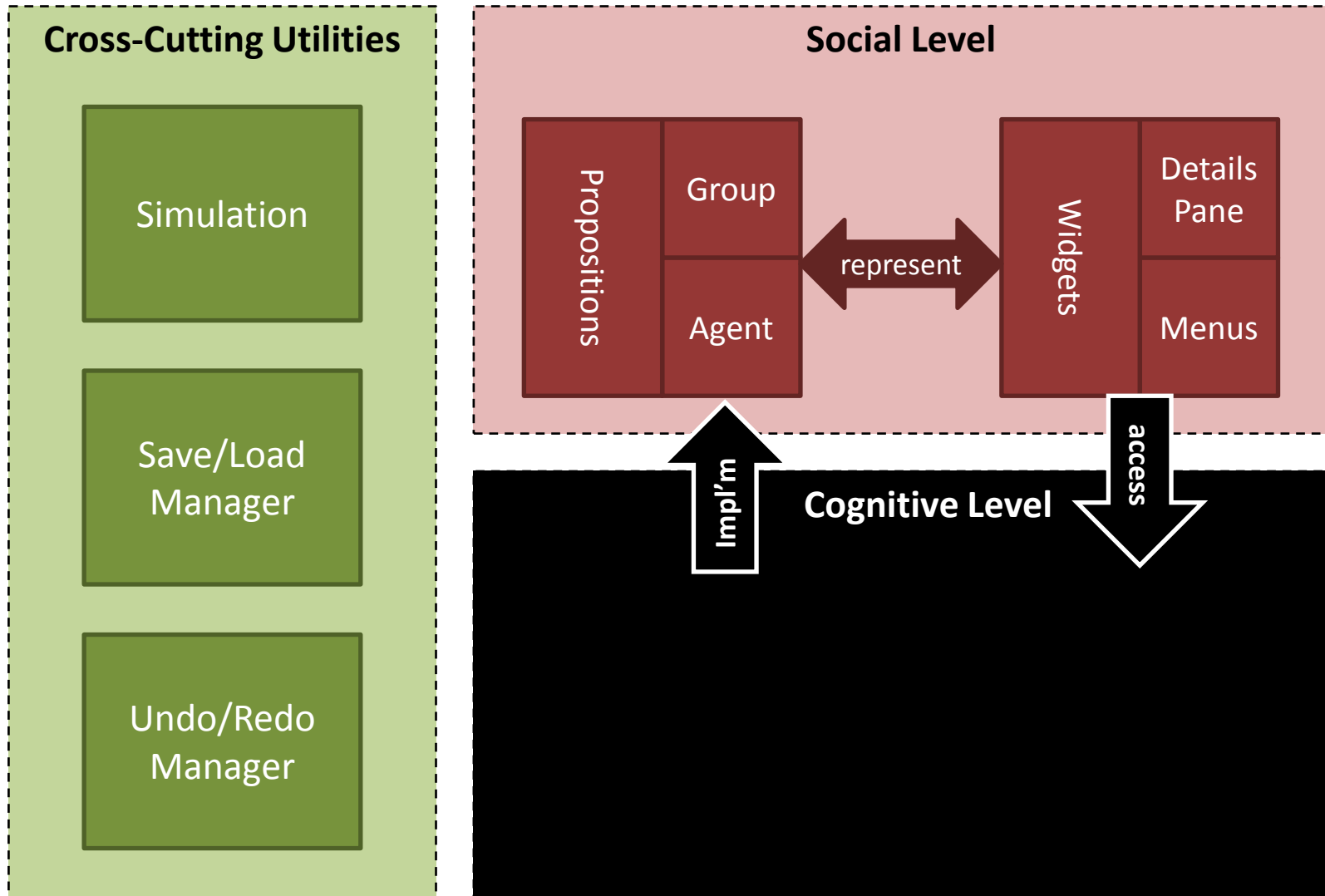- Accessibility to a wide range of users

Design Challenges

- Designing for extensibility
  - Ideally, we want future developers to be able to just plug-and-play with their components

System Structure

System Structure

Design Challenges

- Undo / redo
  - Don't know how the cognitive level handles social events
  - Swarm of commands used for easily extendibility
- Save / load
  - Interface not easily savable
  - Easily extendable structures for separation of data and interface
  - xpp3 used for saving models as XML files

More info…

Thagard, P. "EMPATHICA: A Computer Support System with Visual Representations for Cognitive Affective Mapping." *AAAI Publications, Workshops at the Twenty-Fourth AAAI Conference on Artificial Intelligence*. 2010.

Sahdra, B; Thagard, P. "Self-Deception and Emotional Coherence". *Mind and Machines*. Vol 13. 2003.

Thagard, P. *Coherence in Thought and Action*. Cambrige, MA: MIT Press, 2000.

Thagard, P. "Explaining Economic Crises: Are There Collective Representations?". *Episteme, the Journal of Social Epistemology*. Vol 7, Iss 3. October, 2010.

Thagard, P. *Hot Thought: Mechanisms and Applications of Emotional Cognition*. Cambridge, MA: MIT Press. 2006.

Summary

- LIMBS models people – the way they interact, make decisions, and react to information within their environment
- Stand alone Java application designed for immediate use and easy extendibility