Exploiting Task Models

- The *same* task model?
Task Models

- Task models describe the steps required to accomplish the user’s goals.
  - User-centered
  - Formal
  - Declarative
- Task elicitation is a separate problem
  - U-Tel (Tam et al. 1998)
  - ConcurTaskTrees (Paterno & Mancini 1999)
  - Learning by Example/Demonstration (Garland K-CAP 01)
A Simple Task Model

- Hierarchical breakdown
- Parameters, bindings, ordering constraints
  - E.g. Enter name *precedes* Initiate Login
Collaborative Interface Agents

- Collagen is a tool for building task-aware collaborative interface agents
- A spectrum of task-based collaborative support
  - Tutoring
  - Intelligent assistance
A Collagen Agent in Action

Before starting a generator, always make sure that the alarm light is off so that you’ll know when a new alarm appears. Press the alarm reset button on the generator to extinguish the alarm light.
Collaborative Agent Architecture
Connecting Agents to Applications

- Connecting agents to applications is hard
  - (Lieberman 1998)

- Agents require access to the application internals
  - Agent must be able to affect the application
  - Agent must know what the user has done
The Agent Interface

- Connects the agent with the application
- Agent interfaces are hard to write
  - Requires understanding of both agent and application
  - Must convert between the task model and GUI events
Enter Task-Centered UI Design!

- Task-centered UI design
  - Build the UI through formal modeling
  - Begin the design process with a task model
The Task-GUI Mapping

- A formal description of the relationship between tasks and UI objects / events.
- Everything you need to create an agent interface!
- Automatically produce the agent interface code from:
  - Task model
  - UI specification
  - Task-GUI mapping
The VAMPIRE GUI editor

- Tool support for task-centered UI design
- Very similar to conventional UI design environments
  - E.g. Visual Studio, JBuilder
- Constructs models interactively while UI is designed
- Produces an UI specification in UIML
Using the Task-GUI Mapping

- BATS: Bridging Agents, Tasks, and Software
Demo time!
Contribution

- Connecting agents to applications is hard
- Solution: leverage a shared task model
  - Generic agent middleware
  - Task-centered GUI design
  - Double the return on your investment
- Agent integration “for free”
  - You create task model
  - You use task-centered GUI design tool
  - We do the rest
Future Work

- Richer task models
  - Which tasks are most important or most difficult?
  - Who has permission to perform each task?
  - Who knows how to perform each task?

- **Design methodology** for combining GUIs and collaborative agents using task models
  - Which functions allocated to GUI vs. agent?