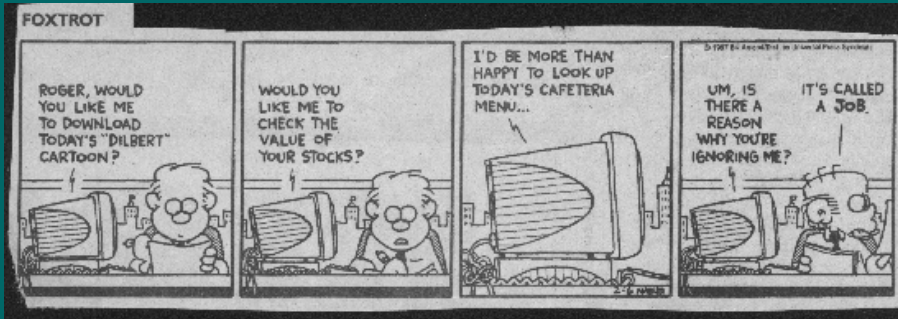# (Embodied) Interface Agents

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This material has been developed by Georgia Tech HCI faculty, and continues to evolve. Contributors include Gregory Abowd, Al Badre, Jim Foley, Elizabeth Mynatt, Jeff Pierce, Colin Potts, Chris Shaw, John Stasko, and Bruce Walker. Permission is granted to use with acknowledgement for non-profit purposes. Last revision: January 2007.

Agenda

- UI Agents
    - Issues
    - Examples

Yet To Come…?

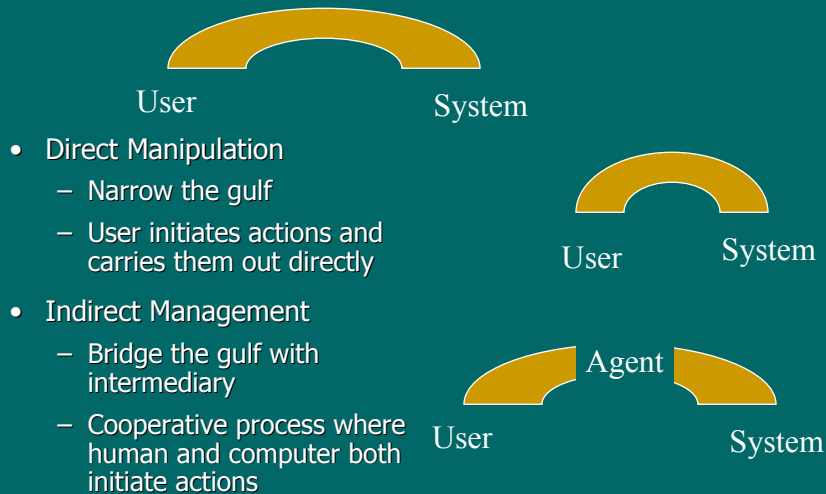
Interaction Paradigms

- Direct Manipulation
  - User initiates actions and carries them out directly

- Indirect Management
  - Cooperative process where human and computer both initiate actions

Agency & Norman's Gulfs

User   System

- Direct Manipulation
  - Narrow the gulf
  - User initiates actions and carries them out directly

User   System

- Indirect Management
  - Bridge the gulf with intermediary

Agent

  - Cooperative process where human and computer both initiate actions

User   System

Autonomous Agent

- Personal assistant who collaborates with user to accomplish tasks
  - Level of autonomy can vary
  - Takes directions
  - Takes initiative
  - May learn user's preferences
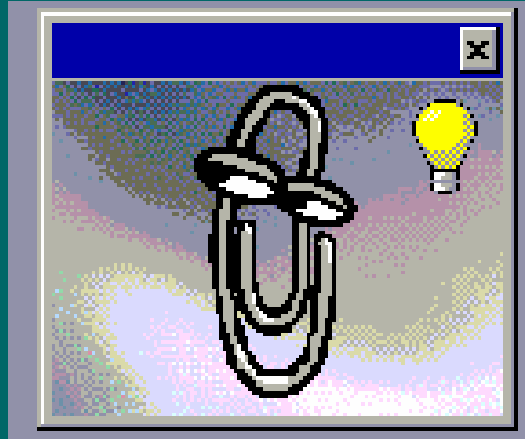 - Human appearance?

Terminology

- IVA – Intelligent Virtual Agent (Assistant)

- ECA – Embodied Conversational Agent

- Chatterbot, Chatbot

Examples

Peedy the Parrot   Merlin the Wizard   Genie   Robby the Robot

Ack! It's the Paper Clip

Challenges

- Two challenges exist
  - <u>Competence</u> - Does the agent have the requisite knowledge to truly assist the user?
  - <u>Trust</u> - Does the user feel comfortable delegating task to agent?

More help...

Possibilities

- What could agents do for us?

Agency Approaches

- 1. Application is semi-autonomous agent
  - User programs rules a priori for how agent should perform

- 2. Knowledge-based
  - Give the agent interface domain knowledge and user knowledge

- 3. Learning approach
  - Give agent minimal domain knowledge, then have it watch user and learn behaviors

Learning Approach

- Like a personal assistant who gets better and better

- Learns by
  - 1. Looking over shoulder, watching actions
  - 2. Direct and indirect feedback
  - 3. Hypothetical examples
  - 4. Asking other agents for advice

Examples

- Email agent
  - Prioritize, delete, sort, …
  - Looks at fields to make decisions (How weighted?)
  - Has "tell-me" and "do-it" thresholds for individual actions
  - Has facial expressions to communicate state
- Meeting scheduler
  - Very personalized behaviors

Examples

- News filtering
  - Watches what you read, then does filtering
  - Uses keywords
  - Needs deeper natural language help

Examples

- Entertainment agent
  - Agent memorizes user's preferences
  - Goes out and talks to other agents and looks for correlations
  - Makes recommendations

Videos

- Vision: Apple's *Knowledge Navigator*
  - Early '90's

- Reality: MIT's REA
  - CHI '99

Issues

- Should agents be made human-like?

- If so, should they have personalities?

- How can we guarantee privacy if agent collaboration occurs?

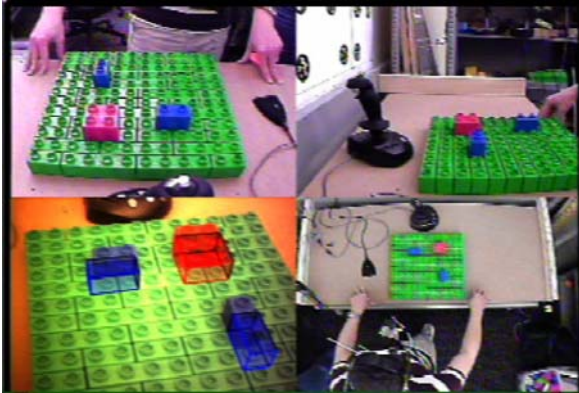- Should someone be held responsible for what their agent does?

Project

- P3 feedback

- Will have reports for you to look at

- Demo sign up

Would you like to participate in an Augmented Reality Research Study?

- **An investigation of ways of giving instructions using 3D graphics**
- **Experience a see-through head-worn display that blends 3D graphics with the real world**

Will involve approximately 90 minutes of your time at $5/half-hour

If you are interested in participating in this study, please contact Cindy Robertson at leistner@cc.gatech.edu.

InfoVis HW

- Pile on desk

Upcoming

- CSCW

- Ubiquitous Computing

- Project presentations