What are Agents?

The definition of an agent is the subject of much controversy in the field of Human-Computer Interaction. For this assignment we will restrict the definition to a piece of software that performs the following four tasks:

Observation

Software monitors user behavior and external events, watching for the correct moment to take an action.

Examples:
- chime that rings when car lights left on
- thermostat that triggers furnace when temperature drops below a threshold
- toilet that automatically flushes when user walks away

Learning

Software monitors user behavior and draws inferences such as a users preference or habit. Software that monitors events to learn general patterns.

Examples:
- smart thermostat that learns how to heat a house to a specific temperature by a certain time. Works year round.
- amazon.com's book recommender. Monitors books a user purchases and then employs collaborative filtering to infer preferences

Dialogue

Software that engages users in communication. Generally communication facilitates clarification or acknowledgement. Dialogue generally takes three forms: (i) acknowledgement—confirms an action has happened. (ii) turn taking—seeks clarification or confirmation following user request. (iii) monitoring—proactively seeks clarification or confirmation based on observation activities.

Examples:
- microsoft's clippy when asking users if they are writing a letter.
- automated telephone systems that allows you to check flight status or purchase a ticket

Autonomous Action

Software that takes action on its own whether preprogrammed or from learning.

Examples:
- tivo PVR when recording shows users did not specify
- tivo PVR when deleting shows without user dialogue

Project

Working in teams of two or three, students will design the interaction between a human and a computer agent. Students can use any of the application scenarios below or they can request permission to use one of their own design.

Applications
- **Scheduler:** Design the human-agent interaction for a system that assists users in managing their schedules. The agent should help users manage meetings, meals, events, etc.
- **Smart Home:** Design the human-agent interaction for a system that can assist in control of temperature, lights, windows, and home repair. Explore how the agent interrupts users for clarification of activities.
- **Safe Home:** Design the human-agent interaction for a system monitors all alarms in a home and uses user context information to interrupt user. Alarms include smoke alarm, oven timer, washer, dryer, doorbell, etc.
- **Teen Life:** Design the human-agent interaction for a system that helps teens manage their lives. System should help teens balance academic health, mental health, and physical health.
- **Smart Car:** Design the human agent interaction for a system that assists users in driving and maintenance of their vehicle.
- **Researcher:** Design the human-agent interaction for a system that actively monitors and seeks information desired by the user.
- **Diet Coach:** Design the human agent interaction for a system that assists users in maintaining a healthy diet.
- **Fashion Coach:** Design the human-agent interaction for a system that helps users maintain their wardrobe and helps them choose something to wear.

All designs must address the following issues:
1. How does the system allow users to indicate preferences and tasks?
2. How does the system monitor users to learn tasks and behaviors?
3. How is what is learned in monitoring fed back to the user?
4. How does the system negotiate for control with users?
5. How does the agent interrupt the user for clarification or notification of events?
6. How does the agent communicate its level of intelligence and its domain knowledge?
7. How is the agent instantiated?

Deliverables
1. Short video demonstration of human agent interaction in context. Think of this as a condensed version of the Knowledge Navigator video
2. Presentation outlining user needs
3. Web-based process book