Lecture #2B
Agent Applications

- Agent Typology
- Applications (skim Ch. 9)
- Reference – Weiss, Ch. 9, handouts

Software Agent Typology

- Agent Typology
- Applications (skim Ch. 9)
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Collaborative Agents

- Cooperation + autonomy
- BDI (beliefs, desires and intentions) (+ obligations)
- several motivations
  - problems too large for a single agent
  - for the interconnecting and interoperation of multiple existing systems
  - for distributed problems
  - to enhance modularity, speed, reliability, flexibility and reusability at the Kn level
- eg. Electric Elves, CMU’s Pleiades system (task agents and infoagents, KQML+e-mail), ADEPT, MII, ARCHON, etc.

Interface Agents

- Observing and imitating the user
- Receiving positive and negative feedback from the user – build a user profile
- Receiving explicit instructions from the user
- Asking other agents for advice
- Learning and using learned knowledge, negotiate with other agents, extend to more interesting areas such as entertainments
- eg. scheduling meetings, assistance in web browsing, remembrance, news agents, matchmaking (buyer and seller), classifying ads service, etc.

Mobile Agents

- Reduce communication costs, Limited local resources, Easier coordination, Asynchronous computing, Free market trading service, Flexible distributed computing, etc.
- Eg, Telescript architecture
  - Telescript is an interpreted object-oriented and remote programming language
  - Telescript engine (telescript API and OS) sends off and accept mobile agents.
- Java, Agent-Tcl, Safe-Tcl, etc.
- Transportation, authentication, secrecy, security, cash, performance issue for too many mobile agents, interoperability, brokering/directory services, service communication
**Information/Internet Agents**
- Drowning in data, but starved of information
- Managing, manipulating or collating information from many distributed sources
- Searching and indexing
- Using a host of internet management tools such as Spiders (a Spider is an indexer able to search the WWW, depth-first, and store the topology of the WWW in a DBMS and the full index of URLs) and search engines in order to gather the information
- Eg. softbot

**Reactive Software Agents**
- No internal symbolic model of environment
- The physical grounding hypothesis “... in order to build a system that is intelligent, it is necessary to have representations grounded in the physical world...”
- Complex patterns of behavior can emerge from their interactions when the ensemble of agents is viewed globally.

**Hybrid Agents**
- Union of the benefits of agents of several different philosophies
- Eg. InteRRap (deliberative + reactive), TouringMachines (dynamic + rational + mobile), Hayes-Roth’s integrated architecture, PRS (procedural reasoning system), CIRCA

**Heterogeneous Agent System**
- An integrated set-up of at least two or more agents which belong to two or more different agent classes
- Eg. PACT

**Software and Robotic Agents**

**Software Agent Applications**
- Air Traffic Control
- Patient Monitoring (Medical)
- Search Agent (Job Agent)
- E-Commerce
- Games (soccer, ...)
- Search and Rescue
- Personal digital assistants
Robotic Agent Applications

- Deep sea exploration and salvage
- Nuclear power plants
- Land mine searching and sweeping
- Vacuum cleaning
- Shopping
- Search and Rescue
- Games (soccer …)

Electric Elves + Wireless Devices

- Enable remote human interaction with agents
  - Scheduling information, queries, short messages...
  - Order meals from the beach!
- Enable agents to track human location
  - GPS (but does not work inside buildings, tunnels)
  - PALM to PALM beaming
  - Not sufficient for tracking; “finger”, other sources fused

Roomba Robotic Vacuum

WAP Phone

Palm VII + GPS
Summary

- Agent Classification
- Agent Applications
- Software agents
- Robotic Agents

Questions