1 Overview

Five ongoing trends have marked the history of computing:

- **Ubiquity**: Ensures computing is available everywhere.
- **Interconnection**: Enables the sharing of information and resources across networks.
- **Intelligence**: Incorporates machine learning and artificial intelligence to enhance computing systems.
- **Delegation**: Improves efficiency by distributing tasks and decision-making responsibilities.
- **Human-orientation**: Focuses on user-friendliness and accessibility.

Programming has progressed through:

- **Human-orientation**
  - Designation, and
  - Instruction.
- **Interconnection**
  - Application.

1.2 Internet Agents

Searching the Internet for the answer to a specific query can be a long and tedious process. So, why not allow a computer program—an agent—to do searches for us? The agent would typically be given a query and then search for relevant information. It may require quick and efficient updates — this is costly and it requires the uncoordinated execution. This is costly and it requires the uncoordinated execution. This is costly and it requires the uncoordinated execution.

When a space probe makes its long flight from Earth to the outer planets, a ground crew is usually required to continually track its progress and decide how to deal with unexpected events. This is costly and it requires the uncoordinated execution. This is costly and it requires the uncoordinated execution.

NASA’s DSI is doing it now!
An Introduction to Multiagent Systems

An agent is a computer system that is capable of independent, autonomous action on behalf of its user or owner.

A multiagent system is one that consists of a number of agents, which interact with one another.

In order to successfully interact, agents need ability to cooperate, coordinate, and negotiate.

- **Two key problems:**
  - How do we build agents that are capable of independent, autonomous action in order to successfully carry out the tasks that we delegate to them?
  - How do we build agents that are capable of interacting (cooperating, coordinating, negotiating) with other agents in order to successfully carry out the tasks that we delegate to them, particularly when the other agents cannot be assumed to share the same interests/goals?

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2 Some Views of the Field

**Agents as a paradigm for software engineering:**

Software engineers have derived a progressively better understanding of the characteristics of complexity in software. It is now widely recognised that interaction is probably the most important single characteristic of complex software.

**Agents as a tool for understanding human societies:**

Multiagent systems provide a novel new tool for simulating societies, which may help shed some light on various kinds of social processes.

**Software engineering as an approach to multiagent systems:**

This viewpoint suggests that software engineering techniques can be applied to the design and development of multiagent systems.
Isn't it all just Distributed/Concurrent Systems?

Isn't it all just AI?

Isn't it all just Economics/Game Theory?

Isn't it all just Social Science?