Mobile Computing and Computation

- **Mobile Computing** concerning computation that is carried out in mobile devices (laptops, PDAs, mobile phones, etc.)

- **Mobile Computation** concerning computations that move between devices (applets, software agents, etc.)

Mobile Computation

- Give programmers control over the placement of code and active computations across nodes in a network
- A mobile program can transport its state and code to another execution environment in the network where it resumes execution

Weak Code Mobility

Moves code, but not active computations

- SQL
- Java Applets
- Postscript
- ...

Understanding Code Mobility by Alfonso Fuggetta, Gian Pietro Picco, Giovanni Vigna
http://citeseer.nj.nec.com/fuggetta98understanding.html

Mobile Ambients by Cardelli and Gordon
http://citeseer.nj.nec.com/30783.html
**Strong Code Mobility**

Moves code and active computations.

Programs contain a command like `go <location>` that moves some or all of the program to `location`, together with it’s execution state - variables, call stack etc.

Example languages:
- Java Voyager
- Java Go
- Pict
- ...

**Advantages**

- Reduce load on servers e.g. send applets to browsers
- Send the code to where the resources are:
  - query to data, e.g.
    - (weak) send SQL queries to distributed databases and accumulate data
    - (strong) send an agent to each database to accumulate data
  - program to services e.g. a booking agent can visit airline, hotel and car rental servers
- Reduce load on network (point to point) communication
- Give programmers control over the placement

**Mobile Computing Critique**

- No more powerful than distribution: just gives control to the program rather than a server
- A different way of thinking about distributed systems
- Not widely adopted: servers are unwilling to allow code through their firewalls