Context-Awareness
Ch. 8 of Ubicomp Fundamentals

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- Canonical Problem:
    - "You are in an unfamiliar office environment and would like to find the closest printer?"
- No Tech Solution:
    - Find someone who knows the answer and ask them
- The Simple Tech Solution
    - Find a list of printers online and a map and figure out which is closest
- The Context-Aware Solution
    - Use a program which ranks printers by proximity

: Context Awareness

- The Context-Aware Solution requires:
    - Knowledge of where the user is
    - Knowledge of where the printers are
    - Infrastructure for maintaining the accuracy of the information
    - Software to make this information available at the right time

: Context Awareness

- The first round of context-aware systems were essentially location-based services

- The Active Badge
  - created a directory of locations of people
  - enabled routing of land-line calls to offices

- Modern LBS include
  - Siri geo-fencing
  - Sex Offender GPS anklets
  - Yelp Restaurant Finder
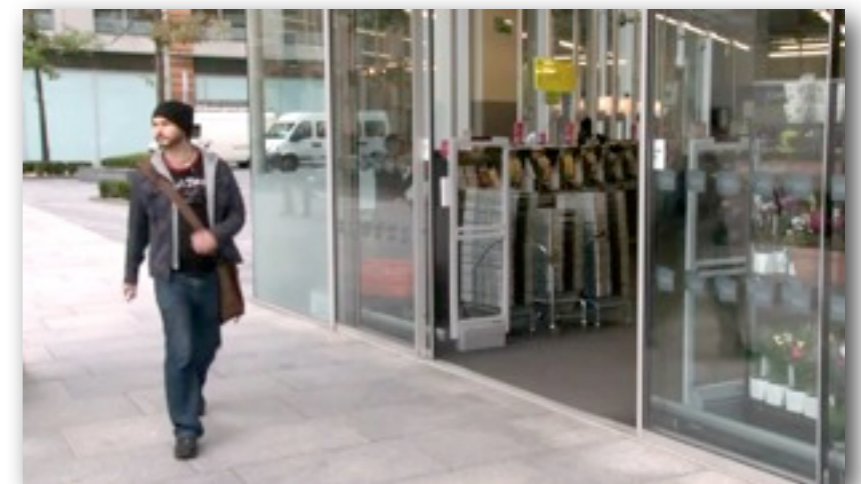
- Can we use more information about the world to help the application than just location?

  - orientation

  - light levels

  - accelerometers

    - protecting hard drives

- What else?

- The information that makes a computer do a better job of adapting to the human world is "context"
- Definitions include:
  - "where you are, whom you are with, what resources are nearby" - Schilit
  - "the subset of physical and conceptual states of interest to a particular entity" - Pascoe
  - "any information that can be used to characterize the situation of an entity. An entity is a person, place or object that is considered relevant to the interaction between a user and an application including the user and the application themselves." - Dey

- "adapt according to it's location of use, the collection of nearby people and objects as well as changes to those objects over time" - Schilit et.al.

- "automatically provide information and/or take actions according to the user's present context as detected by sensors" - Brown

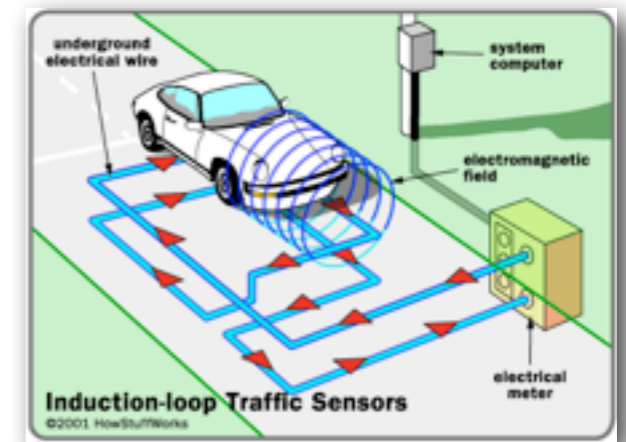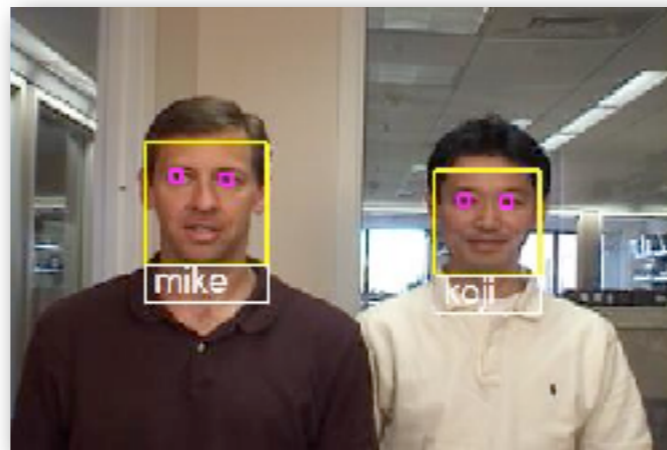- "provides relevant information and/or services to the user, where relevancy depends on the user's task"

- Computers regularly adapt to their input

- Context-Awareness is about implicit input from

  - sensors

  - computers

  - other services

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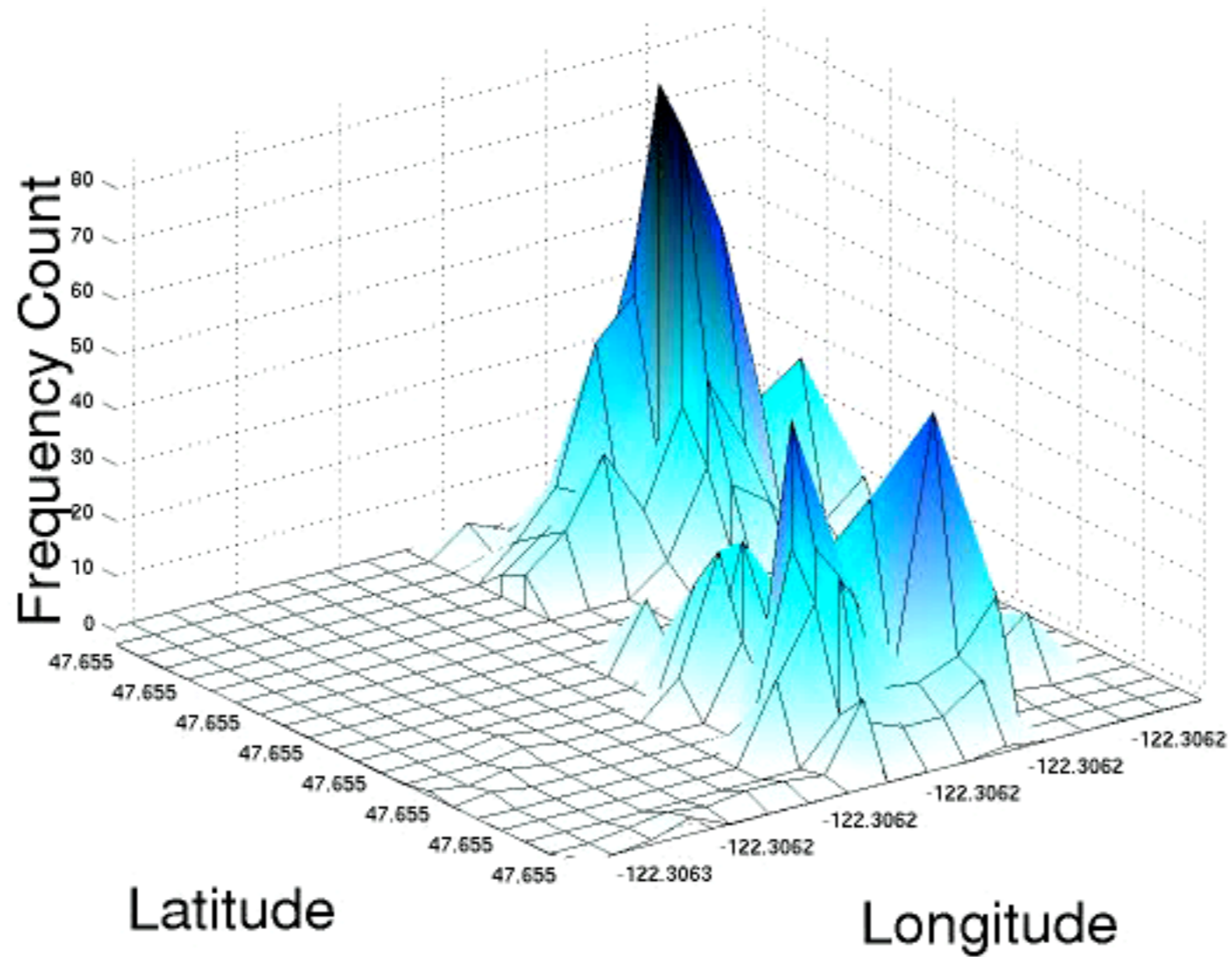 - not all relevant context can be sensed (yet)

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    - rules vs machine learning
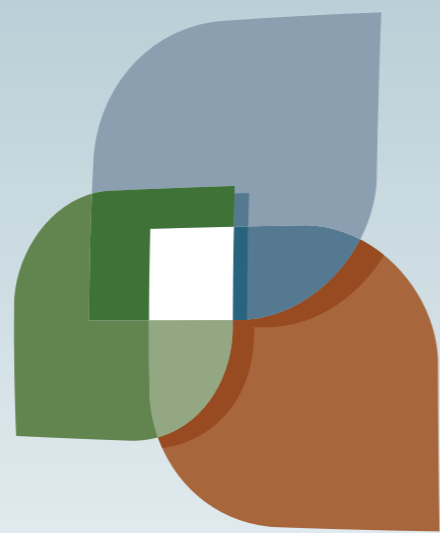
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