Gathering context data

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Practical goals

- Gather context data with off-the-shelf hard- and software — Nokia 7650
- Build context data logger that can be given to people easily
- Combine data from several sources
- Work together with ARU observational people

Categories of context data

1. Measurable variables currently available on the phone
2. Additional available data that can be combined afterwards
3. Context/context part descriptions given by user
4. Variables that exist on the phone but we cannot access
5. Variables available with additional hardware

1. Measurable variables

- Location
  - Network, area and cellid
  - No external topological information, nor semantics
  - Both interesting topics on their own
- Chosen profile
- Ambient sounds
  - at least sound level
  - maybe sound pattern recognition?
- Bluetooth environment

2. Data to be combined

- Calendar events
  - Category (like meeting, leisure, reminder)
  - Location
  - Description (supplied by user)
  - Contacts
- Call and SMS data
- All with date and time

3. Descriptions given by user

- Descriptions given for the whole context (e.g. in a concert, at work)
- or to parts (place names)
- Either written free text, selected from a predefined (or user-defined) list, or spoken
- Balance between ease of input, storage requirements, flexibility

4. Available on phone in theory

- Light level
- Distance sensor
- Temperature
- More detailed network information (other nearby base stations, distance to base station)

5. Available with more hardware

- GPS location (with matchbox size sensor at 400e)
- Bluetooth based location (tags/phones/whatever in some more local areas)
- Accelometer and tilt sensors (maybe not very feasible)

Analyze

- Clustering
- Classification from user supplied names

Sub-problems

Location

- Constructing semantics for cellid-based location data (user-supplied, from calendar event descriptions)
- Reconstructing a global topology from cellid-base location, and distance measurements
- Combining different location data (GPS works well outside city centers, dense cell net in cities, local knowledge from Bluetooth infrastructure)
- Communicating location to others

Ambient sound

- Maybe many contexts could be identified by sound?
- How ambitious are we (sound level/speech/pattern recognition)

What others have done with such data/what could be easily done

Location

- Notes/reminders/alarms based on location
- Communicating location to others (where do we get shared semantics)
- Distances, calendar event alarms based on predicted distance
- Route recognition/next location prediction

Calendar

- Infer event attendance based on previous attendance
- Change profile when event starts (hard-coded, learned)

Sound

- Match alarm sound level to ambient