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CENS Center for Embedded Networked Sensing

Campaignr: A Participatory Sensing Software Architecture for Cellphones

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CENS Urban Sensing◊, REMAP♣ - http://campaignr.com

Introduction: A flexible software application for tasking cellphones to collect data.

Smartphone Sensing Technology

Image
Video
Audio
GPS
Cell ID
Motion Band

Bluetooth
Text (constant, multiple choice, user input)
IMEI
Battery Level
Time

Works for any Symbian S60 3rd Ed. Phone

- **Written in Symbian C++**
  – Makes use of *preexisting* APIs.
  – Able to upload data over GPRS and WiFi.
  – All data stored *reliably* in a separate database per campaign.

- **Open Source**
- **In Use by Groups Around the World**

Campaigns: Reusable and Configurable Platform for Participatory Sensing for Embedded Mobile Devices.

PEIR
- GPS
- Cell Tower ID
- Time
- Upload

Diet Sense
- Image
- User
- Time
- Upload

Remapping LA
- Image
- GPS
- Text
- Time
- User
- Video
- Audio
- Upload

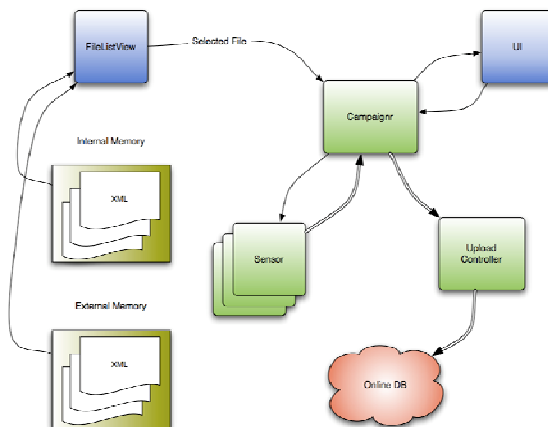## Exposition: An application that is robust and flexible enough to be used in many situations.

Sample XML file

Campaignr is controlled by XML files

```xml
<campaign name="Raccoon">
 <automatic>
  <sensor type="image"/>
  <sensor type="timestamp"/>
  <sensor type="text" name="username">
   <text>test</text>
  </sensor>
  <upload type="sensorbase.org">
   <project id="48">
    <table name="Images">
     <field name="image" sensor="image"/>
     <field name="time_stamp" sensor="timestamp"/>
     <field name="user_name" sensor="username"/>
    </table>
   </project>
  </upload>
  <interval>60</interval>
 </automatic>
</campaign>
```

This campaign collects an *image* every *60* seconds, attaches the *time* it was captured, and an *username* of who took the picture. Then uploads the data to *SensorBase*.

Workflow

Current and Future Work: Improvements and Enabled Areas of Research.

- **Power Management**
- **Trusted Platform**

- **Robust Disconnection Handling**
- **Adaptive Sampling**

- **Plugable Architecture**
  – Sensors
  – Uploaders
  – Filters
  – Triggers

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