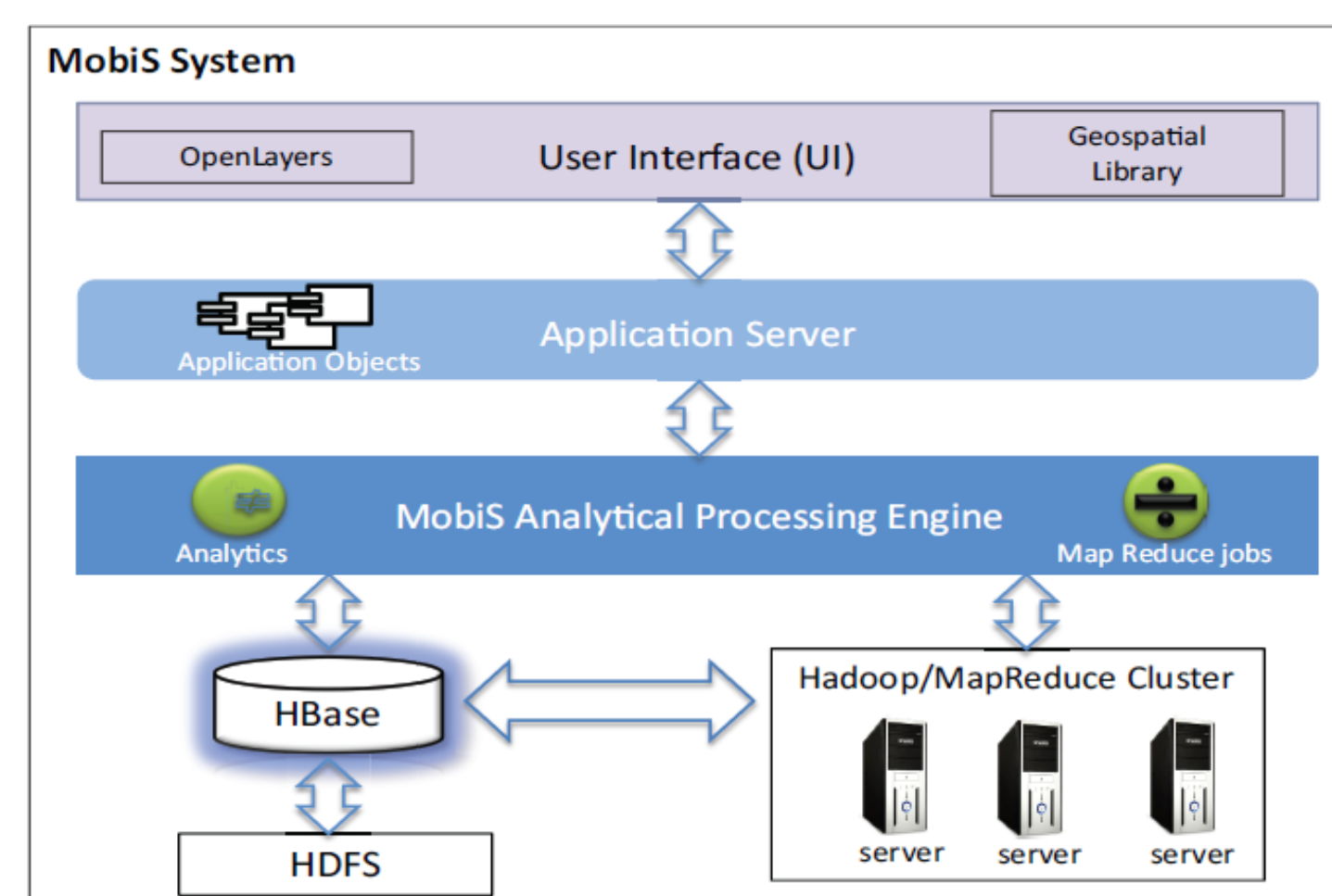


# A distributed paradigm of mobile sensor data analytics for evaluating environmental exposures

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## Objectives

- Develop an efficient and reliable mobile data acquisition system and a distributed paradigm for storing and processing data.
- Design spatio-temporal models for individuals' environmental exposures.
- Develop data mining algorithms for a large volume of mobile data.



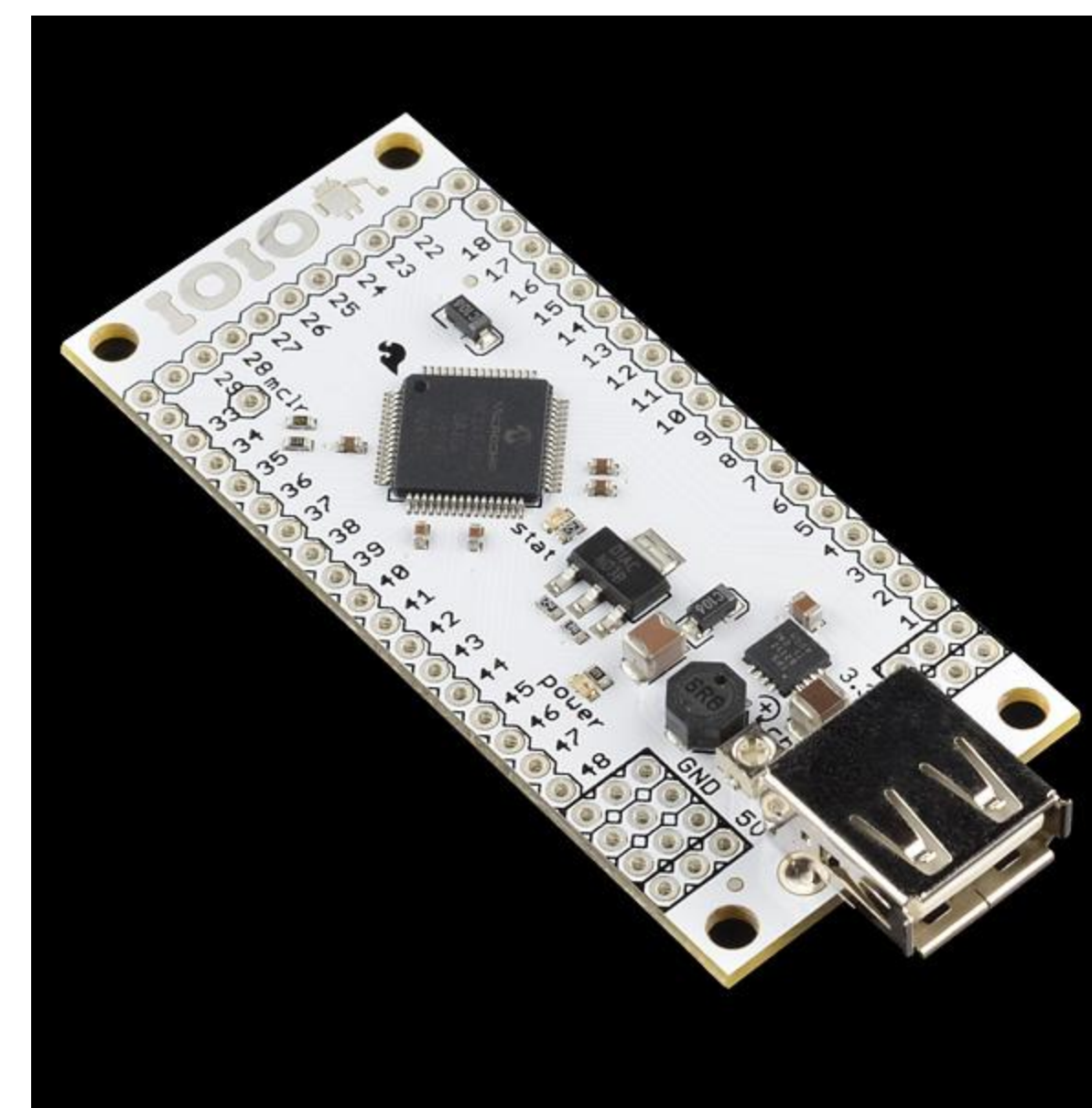
## Bluetooth

- A wireless technology standard for exchanging data over short distances from fixed and mobile devices.
- Operates in the 2400.0 – 2483.5 MHz range.
- Packet based protocol with a master-slave structure.
- Master can handle up to 7 slave devices at a time.
- Frequency-hopping spread spectrum, individual packets are transmitted on one of the 79 designated Bluetooth channels.



## IOIO for Android

- Circuit board specifically designed to work with Android version 1.5 and up.
- Provides robust connectivity to an Android device via a USB or Bluetooth connection.
- Fully controllable from within an Android application.
- Base for our sensor package.

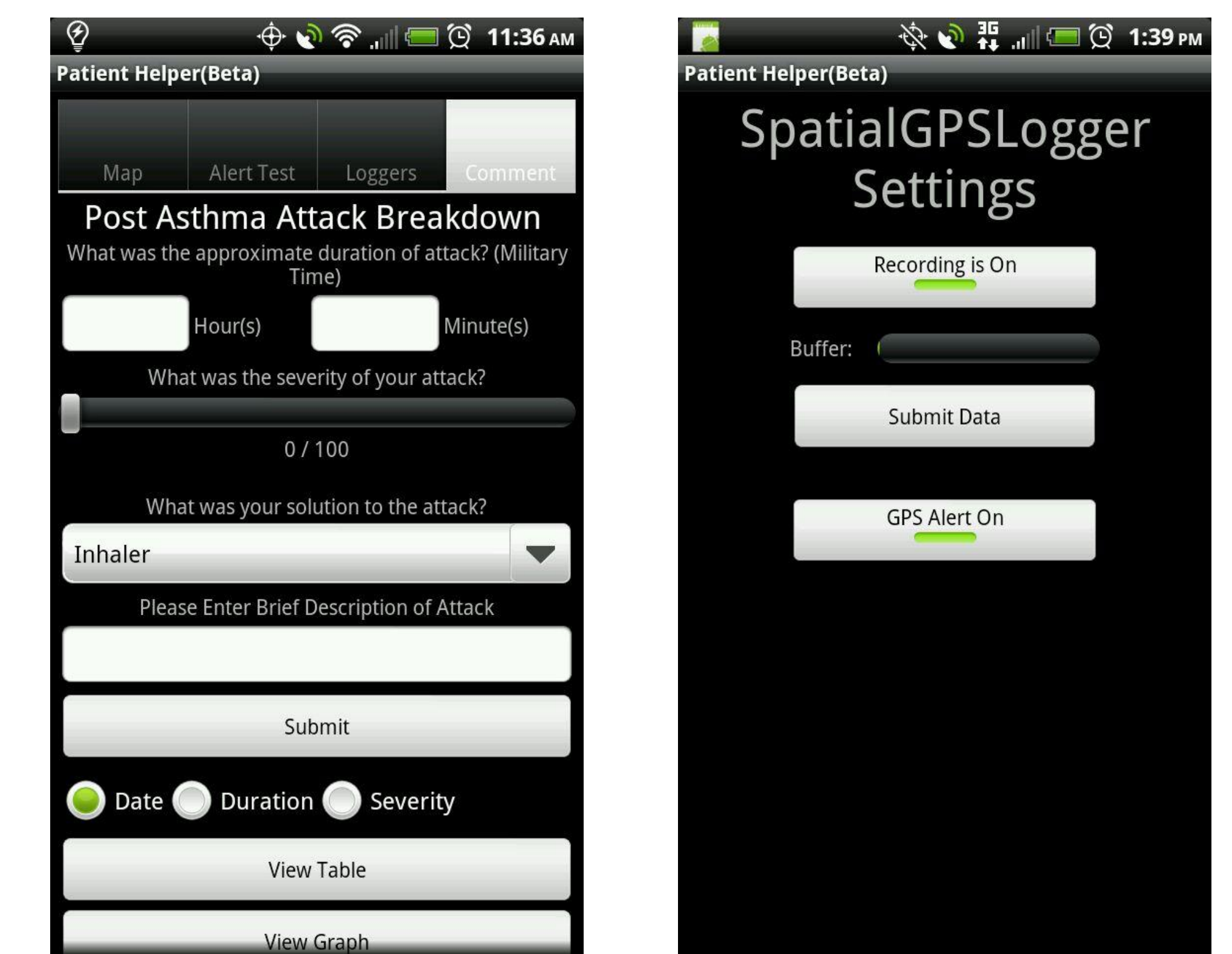


## Environmental Sensors

- We use six environment and position sensors.
- Position Sensors:
  - GPS
  - Motion Sensor
- Environmental sensors:
  - Temperature
  - Humidity
  - Carbon monoxide
  - Dust particle sensor

## Patient Helper

- Android application targeted at asthma sufferers.
- Collecting environmental and spatial data of patients for future analysis.
- Allows the user to record information about any attacks that they have while are using the application.



## Possible Applications

- Traffic management
- Environmental monitoring
- Healthcare monitoring
- Satellite image analysis
- Homeland Security