Biolive project summary

Overview

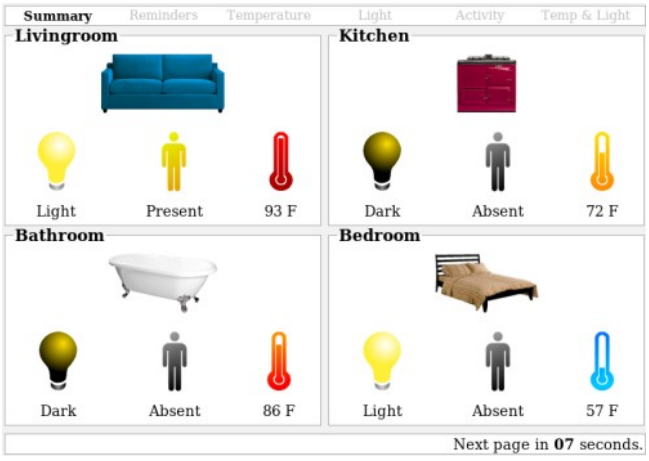
The phase one prototype of the Biolive system integrates the latest in wireless sensor networking, X10 home automation technology, and compact, energy efficient computing with a view to enable independent living via environmental monitoring, reporting and automated reminders.

System features

- Environmental monitoring and reporting.
- Automated reminder system.
- Easy to read informational display via user's television set.
- Low energy consumption.
- Near silent operation.

Residential hub

The residential hub — or base station — of the Biolive system is built upon a computer known as the EFIKA. The EFIKA is a compact yet versatile, low energy, almost silent computer created by Genesi. The EFIKA is used to collect and store data from both the wireless sensor network and the X10 PIRs (passive infra-red detectors). This data



Environmental summary

EFIKA and motes

can then be analysed and used to produce reports and recommendations that can be displayed on the user's television set.

The EFIKA can also be used to store automated reminders that can be displayed on a television set, played audibly, and sent to any Bluetooth enabled device such as a mobile telephone.

Reminder system

Wireless sensor network

The system's wireless sensor network is made up of two types of sensors — known as motes — that communicate wirelessly over the low power protocol ZigBee. ZigBee has been designed for ad-hoc mesh networking; this means that the motes can automatically detect one another and set-up their own network infrastructure. The two types of motes used in

the Biolive system are called MICAz and TelosB motes, they are manufactured by Crossbow Technology.

The system uses the MICAz motes to collect environmental data such as the temperature and light level, they are battery powered and small enough to be easily hidden from view. A TelosB mote is physically connected to the residential hub (via a USB port) to enable the EFIKA to receive data from the MICAz motes.

MICAz and TelosB

X10 home automation technology

X10 is an international open standard that is used for communication (over mains power) between home automation devices. The Biolive system uses X10 technology for monitoring user activity via PIRs. The PIRs, which are produced by Marmitek, can be used to determine in which room the user is currently situated, as well how active they are; this information is sent back to the EFIKA where it is stored and analysed.

What's next?

Future versions of the Biolive prototype system will be more focused on analysing and acting upon the data recorded by the current version. The following are features that are currently under investigation for future inclusion:

- User interaction via television remote control.
- Intelligent monitoring interface for telecare operatives.
- Expert system for producing user recommendations.
- Control over home automation appliances, such as lighting and heating system.
- Integration of multimedia services via a connection to the Internet.

Further information

Biolive: http://biolive.wlv.ac.uk

Crossbow: http://www.xbow.com/

Genesi: http://www.genesippc.com/

Marmitek: http://www.marmitek.com/

Written by Adam J. Forster
System Developer
adam.forster@wlv.ac.uk

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University of Wolverhampton
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