WIRELESS SENSOR NETWORKS

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Introduction

Wireless Sensor Networks represent a new technology that has emerged from developments in ultra low power microcontrollers and sophisticated low cost wireless data devices. Their small size and power consumption allow a number of independent 'nodes' (known as Motes) to be distributed in the field, all capable of '*ad-hoc*' networking and multihop message transmission. New routing algorithms allow remote data to be passed reliably through the network to a final control point. This occurs within the constraints of low power RF transmissions in a congested 2.4GHz Radio Spectrum.

System Development

Using the hardware platform designed by Berkley University called "TmoteSky". TinyOS as the operative system and programming in NesC language to design TinyOS applications. Design and improvement of Java applications to display the data collected by these networks.

Experimental Work and Results

Resize the text as necessary. Tables are placed on a 20% blue box.

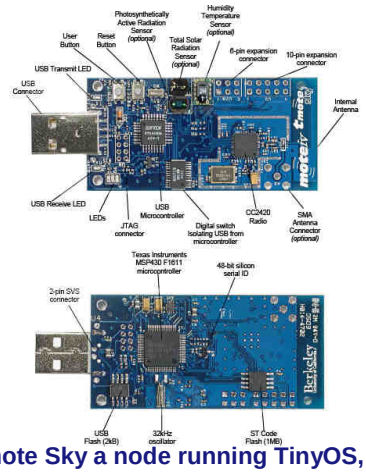


Figure 1. Tmote Sky a node running TinyOS, front and back of the module.

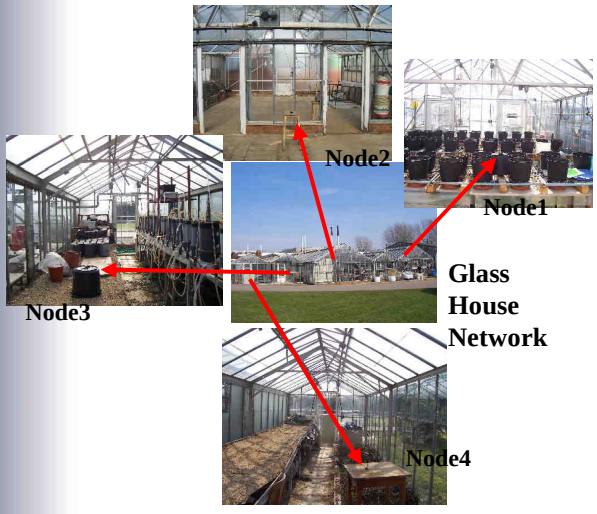
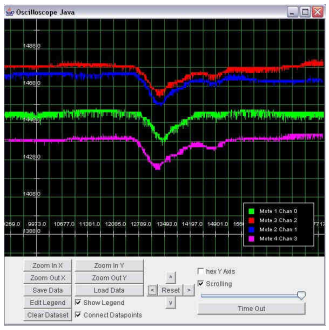


Figure 2. Glass house trial network at Silsoe.



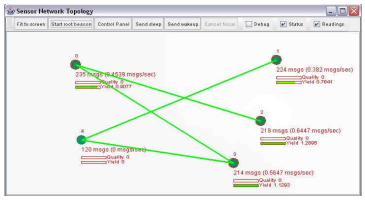


Figure 3. Results from Glass house trial network at Silsoe.

Conclusions

Using trial networks like the Glass house the aim is to develop and design a complete solution to cope with the challenges of time critical situations. An oil leak detection and alarm system is the application that future work in this PhD will be focused in. The final system will be a combination of different innovative techniques as a result of the investigation and real world work.

- **Power management scheme to extend life of network nodes.**
- **Robust and reliable routing technique and communication protocol.**
- **Deployment strategies and design of the network.**
- **Graphical users interfaces and data collection tools.**

Suggested size.

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