

Development of Sensor Network Testbed

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Introduction

Sensor networks are becoming increasingly important as they link our physical world to our computation based virtual world.

Applications of sensor networks

- Habitat monitoring
- Security and military sensing
- Industrial control and monitoring

Key Design Constraints

- Cost
- Energy
- Networking
- Storage capabilities

Aim of this work is to facilitate testing of sensor network applications.

Need of a Testbed

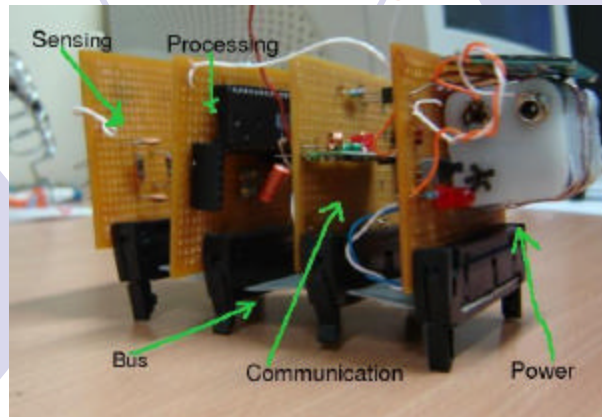
- Optimize hardware
- Reduce Cost
- Reduce development time
- Improve reliability

Constraints demand that hardware is completely application specific

Objective of Testbed

- **Modular:** a piece of hardware may be changed without affecting other
- **Flexible:** additional hardware may be added without redesigning

Our Design



Hardware divided into functional modules : *Processor, Communication, Power and Sensors.*

For modularity, interfaces of modules have been standardized.

Change modules according to the application requirements

Changing one module would not affect others.

Implementation

Nodes to sense light.

Hardware:-

- Processor: ATmega32
- Communication: 433 Mhz Tx/Rx
- Sensors: LDR
- Power: 4AA Ni-cd Batteries

Interconnected them together using FRC.

No of nodes: 5

Result

Able to collect Light readings from all 5 nodes over a main node.

Future Work

- To develop 100 such testbeds
- Test with various configuration
- Test energy efficient Multi-Hop routing algorithms
- Add a mobility and localization module