

Wireless Sensor Networks, only limited by the imagination!

Recent advances in wireless communications and electronics have enabled the development of low-cost, low-power, multi-functional sensor nodes that are small in size and communicate untethered in short distances. A large number of these tiny sensor nodes, which consist of sensing, data processing, and communicating components, can be spatially distributed and collaborate through wireless communications in order to achieve some higher level task. Their unique feature is that they can capture the spatial and temporal dynamics of the environment or the process they monitor.

Imagine:

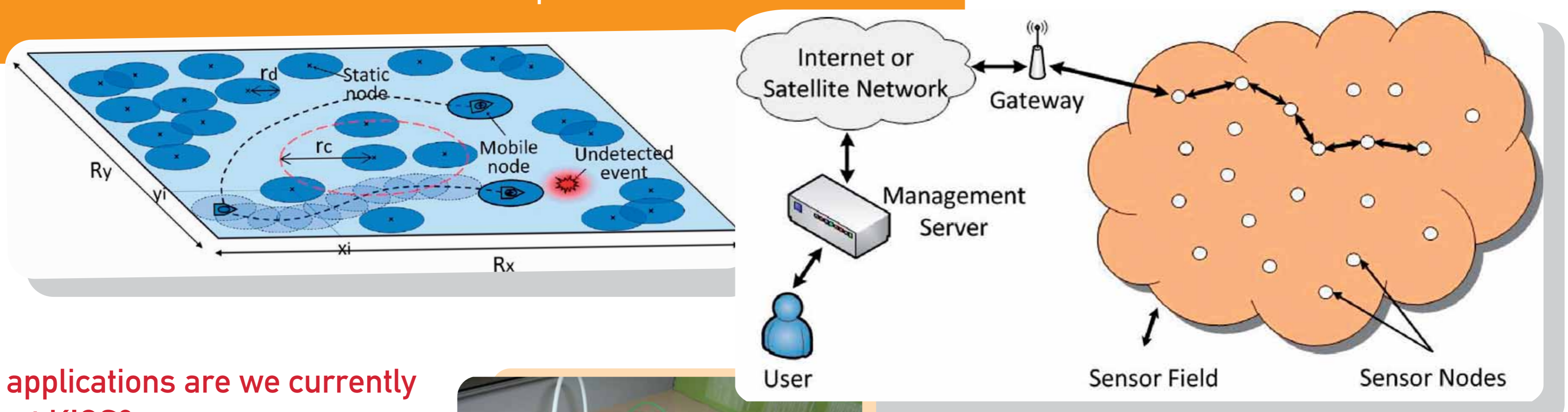
- high-rise buildings self-detecting structural faults (e.g., weld cracks)
- schools detecting airborne toxins at low concentrations and tracing contaminant transport to source
- buoys alerting swimmers to dangerous bacteria levels
- earthquake-destroyed building infiltrated with robots and sensors for locating survivors and evaluating structural damage
- ecosystems infused with chemical, physical, acoustic, image sensors to track global change parameters
- battlefield sprinkled with sensors that identify and track friendly/enemy forces (e.g., air/ground vehicles, personnel)

Today, these applications can become a reality because of Wireless Sensor Networks (WSNs). However, WSN technology comes with unique challenges that have not been traditionally addressed because of the vast number of sensor nodes, the limitations in terms of energy and bandwidth and the harsh conditions of operation.



What research areas are we currently investigating at KIOS?

- Event detection and localization
- Path planning for improving coverage
- Collaborative signal and information processing
- Fault tolerance
- Distributed algorithms
- Intelligent systems and control



What WSN applications are we currently working on at KIOS?

- Environmental monitoring (POSEIDON)
- Intelligent irrigation systems (WaterBee)
- Intelligent buildings (iSense)
- Mobile sensor networks



Some Collaborators

- Boston University, USA
- Politecnico di Milano, Italy
- SignalGenerix Ltd., Cyprus