DESIGNING A MEDIUM ACCESS CONTROL PROTOCOL FOR BODY AREA NETWORKS

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Overview

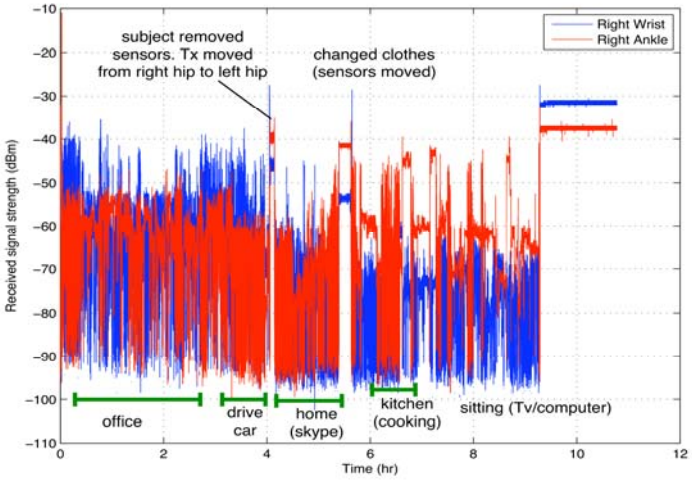
- **Low power sensor nodes communicating wirelessly around human body**
- **Wide range of applications in healthcare, military sports and entertainment**
- **802.15.6 communication standard is being developed by IEEE specifically for BAN**

Current technology allows up to 20 hours of battery life on wireless monitoring devices

The problem

Achieve extreme energy efficiency (to run on small batteries for several years) and satisfy application latency and throughput constraints, while dealing with unique and challenging wireless channel

- Large temporal variations
- Severe shadowing effects
- Interference from other BANs



Research outcomes

Create a set of MAC-layer algorithms that will satisfy application requirements and be compatible with 802.15.6 standard, addressing issues such as:

- Resource (time slot) allocation
- Reliability (retransmissions)
- Cooperative relaying

Approach:

Empirical data from on-body measurements

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Advanced wireless channel models

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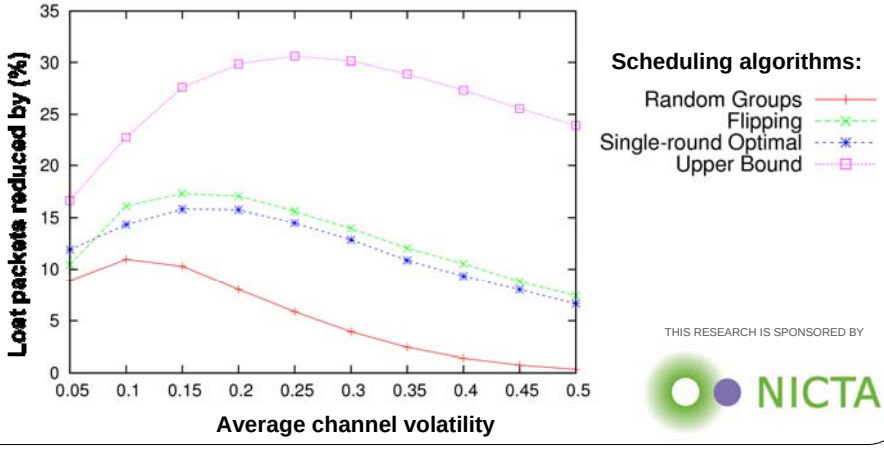
Realistic network-level simulator

Opportunistic scheduling for Body Area Networks – Flipping algorithm

- Based on TDMA approach coupled with sensor nodes duty cycle
- Reduces packet loss by 5-15% before employing retransmissions
- Runs in O(*n*) time, where *n* is the number of sensors in the network
- Compatible with both 802.15.4 and upcoming 802.15.6 standards



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