Titulo:

RIAM-SE: Radio Interference Analysis and Modelling for reliable communications in mobile SEnsor networks

Nome do Aluno:

Nº   Telf/Telm: Email:

Breve descrição do trabalho:

The research bounds of the thesis focus on better understanding of reliable communication mechanism for cooperating objects (e.g sensor nodes or robots) with emphasis on mobility and exposure to abundant communication interference, as is the case in non-regulated sections of the spectrum (e.g. ISM radio bands).

Foreseeable scenarios:

1) *A large number of small (and inexpensive) robots can cooperate to tackle a large problem. These swarms of robots pose important challenges for robot designers as their behaviour isn't as simple to program as a single robot: many algorithms are distributed and rely heavily on communication between the participating members of the swarm. Typically, this communication is time-critical, meaning it has to be completed within a time deadline to be effective.*

2) *A body sensor network (BSN) can capture relevant biometric and physiological parameters of a person and keep updated records in an online service, which inform doctors of suspected anomalies. Only if these wearable nodes in the BSN would be able to communicate reliably this could effectively transform medical services in the near future.*

This work seeks to investigate mechanisms to provide reliable communication among IEEE 802.15.4 compliant radios, an emerging standard for wireless communication in sensor networks. Most of these radios use 16 channels distributed among the 2400-2480 MHz band and employ very low transmission power (~ 1 mW), they are power constrained (fed with batteries) and have short communication ranges (~ 20m). Yet they coexist with all sort of interference producing devices like cordless phones, microwave ovens, wireless LAN cards, Bluetooth, wireless USB, among others.

The candidate will have opportunities to conduct experiments to monitor interference patterns, contribute to proposed solutions (e.g. adaptive power and frequency agility), implement them on real sensor nodes and assess results.

Outros dados relevantes:

Por favor enviar e-mail com CV resumido para mjf@isep.ipp.pt

Este trabalho faz parte de uma colaboração do CISTER-ISEP dentro da Rede de Excelência CONET (http://www.cooperating-objects.eu/)

Para mais informações sobre as actividades de I&D do CISTER R&D na área de redes de sensores, por favor visite http://www.cister.isep.ipp.pt/research/sensor+networks/

Recursos necessários no DEE:

A Unidade de Investigação CISTER disponibilizará os equipamentos necessários. Em princípio, não serão necessários recursos do DEE, a não ser apoio no desenvolvimento de potenciais plataformas de hardware.

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