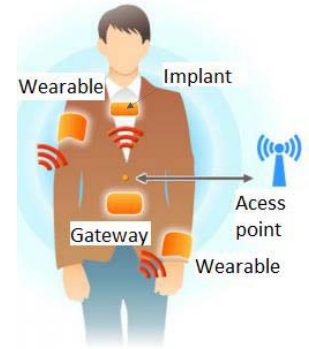


UWB Body Area Networks

Background and challenges

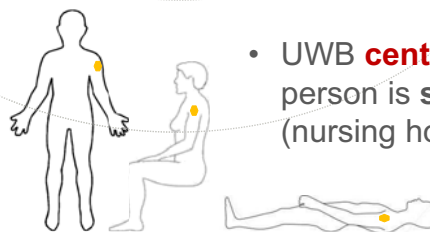
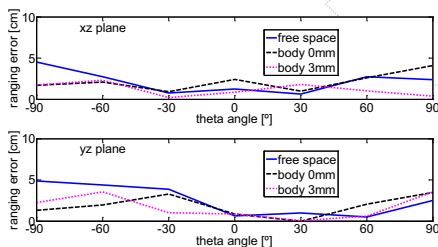
- **Body Area Networks** - various sensors **in** and **on** the human body that communicate with each other.
- Usually one gateway node communicates with an external access point (off-body).
- **UWB** – **Ultra wideband** communication – enables higher bit rates and higher localization precision using low power.
- **Challenge:** human body is a natural **obstacle** to **electromagnetic wave propagation** – antennas have to be especially designed to overcome this.



Description and main innovation

Gateway antenna for off-body communication

- Very **low-profile** and very **small** antennas.
- Very **good** electromagnetic performance in **free space** or at any distance to the body.
- **Immune to** direct **body** contact (maintains properties).



- UWB **centimetre precision** allows determining if a person is **standing, sitting or lying down** injured (nursing homes, hospitals fire fighters, etc.).

Implanted antenna for in-body communication

- **Compact implantable** antenna.
- Very **good** electromagnetic performance **inside the muscle**.
- **Low power** consumption – **harmless, battery-friendly**.
- Suitable for **high data rate** communication (~1 Gbps).
- Transmit vital **health information** (medical history, exams, etc.) which is **rapidly available** to medical staff.



Collaboration in the framework of **COST TD1301** - Accelerating the Technological, Clinical and Commercialisation Progress in the Area of Medical Microwave Imaging

Achievements

- One journal paper, and 3 conference papers published
- One concluded MSc thesis, and two PhD thesis ongoing