Communication protocols for Body Area Networks

Résumé du projet de recherche (Langue 1)

The rapid advances in sensors and ultra-low power wireless communication has enabled a new generation of Wireless Sensor Networks (WSN). Wireless Body Area Networks (WBAN) open an interdisciplinary area within WSN research, in which sensors are used to monitor, collect and transmit medical signs and other measurements of body parameters. The intelligent sensors can be integrated into clothes (wearable WBANs), or placed directly on or inside a body. If typical applications target personalized, predictive, preventive and participatory healthcare, WBANs also have interesting applications in military, security, sports and gaming fields. Care workers, for instance, are really in demand of systems that permit a continuous monitoring of elderly people or patients to support them in their daily life. WBANs history is just at its beginning, and many news and improvements are expected in the next future. Body Area Networks differ from typical large-scale wireless sensor networks in many aspects. The characteristics of the wireless channel are different. Links have, in general, a limited range, a low quality and vary over time due to posture mobility. Besides, the effect of body absorption, reflections and interference cannot be neglected. For these reasons a direct link (one-hop) between the data collection point and the other nodes is very difficult to maintain while keeping a low transmission power.

Résumé du projet de recherche (Langue 2)

The multi-hop communication protocols proposed in literature are not optimized for the specificities of the continuous human mobility. We then need to create new communication protocols that take advantage of the particular connection changes pattern while guaranteeing low energy consumption, such that the network lifetime is long (month, years) even though on-body sensors are equipped only with a little battery.