PULSERS II public UWB Workshop
at the 16th IST Mobile and Wireless Communications Summit

Related IST project: **PULSERS Phase II / UROOF**

Indication of the length of the workshop: **full day**

Title of the proposed workshop: **Ultra-Wideband Technology**

Name of the workshop coordinator: **Sven Zeisberg**

Affiliation of the workshop coordinator: **GWT-TUD GmbH**

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Rational: the overall objective of the workshop

The open international workshop "Ultra-Wideband Technology" will provide an insight into current state of development of Ultra-Wideband Systems in Europe, with particular emphasis on the progress made within the FP6 Integrated Research Project PULSERS Phase II (Pervasive Ultra-wideband Low Spectral Energy Radio Systems).

The workshop will start highlighting technical aspects under analysis in the different areas explored by the PULSERS Phase II consortium, from the driving scenarios to the architecture of the UWB systems, the planned experiments, the main PHY and MAC concepts and inputs into the European and international regulatory process. This will then be followed by an overview on the European and International Status on the Regulatory and Standardisation.

Preliminary program of the workshop:

Part I: (approx. 3-4 h)
After a short introduction into the PULSERS Phase II project the work package *Very High Data Rate (VHDR) Systems* will report on its studies into the definition of the different VHDR scenarios including their description, actors, infrastructure, main applications, etc. Examples given will include feasibility of a Wireless HDMI and Bluetooth v3.0. The work package on *VHDR MB-OFDM Concept Platform* will deliver then its initial public results of the further enhancements of VHDR systems based on evolution of current state of the art standard ECMA 368. Alternative solutions to the MB-OFDM technique is planned to be presented by the work package *VHDR Analogue Technology*. Here the emphasis is on tow analogue solutions feasible to serve for VHDR UWB systems, first results an multi-band impulse radio and second practical experiments of a single carrier low complexity solution will be presented. Then the *Location Tracking* work package will report on a robust low data rate solution with embedded location and tracking based on impulse radio. Besides practical results from first implementations of PHY and MAC including ranging the focus will be also on system architectures and on the possible networking architectures for scenarios containing a high number of devices. The work package *Sensors and Industrial*

Applications will present its final system design and the current state of implementation. Here the emphasis is on autonomous system aspects with a distributed MAC based on gaming theory. The application scenarios include an autonomous robot as well as professional media delivery environments, where the emphasis is on robust location tacking based on combination of UWB with complementing technology. The work package on *LDR – Body Area Network* (BAN) intends to discuss the current state of the art in BAN based on UWB technology. An insight into the project design and the prototype implementation will be given with emphasis on antennas, realistic BAN channel modelling and other physical layer aspects.

Part II: (approx. 3 h)

A group working on *UWB-Cellular* is planning to present its results on the inter-operation of UMTS system with UWB system. The focus is on discussion of concepts for inter-operation to exploit the potential of synergy from the two advanced radio systems. Additionally initial results on practical experiments connecting UWB devices with UMTS devices will be presented. The work package *Multiple Antenna Systems* will discuss results of theoretical investigations of UWB real time MIMO channel measurements and investigations performed to analyse the capacity of UWB systems based on various level of real world effects modelling. Here systems with co-located and distributed antennas as well as relaying network systems are considered. This will be followed by presentations of the *Regulation and Standardisation* group reporting on the work in the area of UWB related regulation and standardisation fora. In particular, an assessment of the current European and international status of UWB regulation will be provided. Also the relevant standardisation groups will be shortly addressed summarising the status of work and providing a schedule for the next activities planned. This will be followed by some invited reports on specific UWB related technology implementation such as UWB fibre optical converters that are studied in another IST project called UROOF. The focus is on the motivations for such a technology and the concept enabling UWB transmission over Optical Fibre. In particular the commonalities between PULSERS II and UROOF projects will be discussed.