

Announcement

It is our pleasure to let you know that on Tuesday, April 10 during 10:00 to 12:00 hours, we shall get a wonderful opportunity to listen the valuable talks delivered by our two guests of eminent people of magnitude of experiences and multitude of knowledge. Please find below title of the talks and CVs of the guest speakers. Please note that this session is organized by CTIF Global Capsule (CGC) and we expect that you would not like to miss this opportunity.

Venue: UTZONE 1, Innovatorium, Birkcenterpark 40, Herning.

Duration: 10:00 -12:00 hours

Talk 1: 4G toward 5G and important Industry Applications

Duration: 10:00- 11:00 hours

Prof. Dr.-Ing. habil. Walter Konhäuser

Abstract:

Based on 4G Technology a lot of industry applications has started already. With 5G will start a new phase of mobile communication and the focus is on the billions of terminals available in the Internet of Things (IoT). We can, therefore, deduce that data traffic will continue to increase dramatically over time. It is estimated 1000 x by 2020. Connected devices will increase over time 10-100 x by 2020. New device types like probes, sensors, meters, machines, control computers etc. will significantly contribute to that increase. New sectors will bring new priorities, like Future Cars with car-to-car communication, autonomous driving and real time navigation, Industry 4.0 with plant of the future, Energy with local energy production and consumption, energy storage, metering, consumption control etc. Broadband communications will stimulate the economy by contributing significantly to GDP and creating employment. The presentation will give an overview of Industry Applications and the enhancements based on future 5G.

Talk 2: IETF Protocols for IoT Sensor Networks

Duration: 11:00- 12:00 hours

Dr. Vinod KUMAR

Sensor networks are an integral part of cyber control systems like Smart Grids. In one common mode of operation of sensor networks e. g for data collection, packet transmission is usually directed from multiple sources to a single sink. The other specific characteristics of such an operation include:

- Application scenarios with sensor densities of up to 10×10^6 nodes/km² and wide range of coverage areas are possible.

- Single hop or multiple-hop paths can exist between the sources and the sink. The routing paths have to be refreshed depending on the application dependent sensor mobility patterns.
- Sensors are battery powered, resource constrained devices and have to operate with very low duty cycle for ensuring long (about 10 years) operational life.
- High reliability packet delivery (e. g 99% packet delivery ratio) between the source and the sink is a must.

In order to cope up with these specific requirements of resource constrained devices, IETF designed a protocol suite which includes 6LoWPAN (an adaptation layer for IPv6 header compression for better fitting the short frame duration used by sensor networks; RPL (a routing protocol for routing over lossy (wireless) links and CoAP (a low complexity application layer protocol enabling the transformation of low power sensor devices into web servers).

Additionally, it is well known that the IEEE 802.15.4 (PHY and MAC layers) forms the basis of implementation of many sensor network applications in the unlicensed band. This technology has a long history of evolution and in the context of cyber physical systems, one enhancement namely the introduction of Time Synchronized Channel Hopping (TSCH) in IEEE 802.15.4e and its adoption by Wireless HART for industrial control applications, is worth a special mention. TSCH proved to be one of the important enabler of for reliable packet delivery in Wireless Sensor Networks operating in the unlicensed band. However, there is still a lack of portability of these custom-built solutions between different application domains.

The main objective of the proposed talk is to explain how the combination of good features of the two protocol families mentioned above helped the implementation of solutions with guaranteed performance in different application scenarios for WSN's. In effect, the interferer diversity and frequency diversity advantages provided by TSCH protect the transmitted packets against interference from other networks (of IEEE 802.11 family) in overlapping coverage areas. Similarly, the routing path diversity available in RPL provides the redundancy advantage which improves both the reliability of packet delivery and energy efficiency by reducing sensor node churn in the route selection process. A real-world application namely "Parking Slot Management in Urban Areas" will be described to illustrate the performance advantages.

CV: Prof. Dr.-Ing. habil. Walter Konhäuser



Walter Konhäuser, born on November 19, 1949 in Ruhpolding, is a promoted electrical engineer, amongst other things actually working as a professor at the Technical University of Berlin in the area of mobile communication systems. He studied electrical engineering at the Technical University of Berlin. The doctorate and habilitation was in the area of automation technology and networking. For more than 25 years he has been active in various business areas for SIEMENS AG, many years as CTO in the area of mobile communication systems and responsible for broadband data access. Walter Konhäuser has 40 years of professional and management experience in R&D, Marketing and Management with P&L responsibility, research and teaching in the field of mobile communication networks, such as 5G at Technical University Berlin, innovation technology development for energy areas (Batteries, Smart Grid and Energy Management), business development in the field of renewable energies, process development for R&D, marketing, product management and sales advisory, board member at a battery development project at Fraunhofer Institute IKTS, former advisory board member at Fraunhofer Institute Fokus, former head of advisory board of start-up company Garderos.

He is a member of the VDE, the German Association of Electrical Engineers and is Spokesman of the regional VDE organization in Berlin and Brandenburg.

Walter Konhäuser stands for openness, solution orientation and high engagement for new challenges.

CV: Dr Vinod KUMAR

Ex Director of Research in Wireless

Alcatel-Lucent Bell Labs, France



Dr Vinod Kumar has 35+ years of experience R&D in mobile communication systems. During 27 years of his tenure in Alcatel-Lucent he has initiated and contributed to multiple research projects in 2G to 5G technologies namely GSM, GPRS, EDGE, UMTS, HSPA, LTE, LTE A systems and in wireless ad-hoc networking. Additionally, he has been involved in standardisation and marketing support activities and in Patent Management related to above technologies. He has participated in multiple international collaborative projects (EC FP6, FP7) and has been Technical Auditor of CELTIC and ANR projects. He represented ALU in Wireless World Research Forum (WWRF) till 2015 and now is an Individual Member of this Forum. Additionally, he has held WWRF Secretary's position (since its foundation in 2001) and WWRF Treasurer position since 2013.

Academic activities of Dr Kumar include teaching graduate courses in mobile communications in ENST (IMT Paris-Tech), CENTRALESUPELEC, ISEP, EURECOM in France and in MNIT in India. He was Associate Professor at the Université de Marne la Vallée in France for six years. He has acted as member of Industrial Advisory Board of CTIF Denmark, of Conseil Technique of SUPELEC-France and also of the joint INRIA-Bell Labs research lab. Other activities include being guest lecturer at IEEE events (on 5G and IoT), guest editor and referee for IEEE publications; PhD guide and examiner with CentraleSupélec and INRIA. He has 80 + technical publications and 30+ patents

Dr Kumar is Director (retd) in Wireless Research programme in ALU Bell Labs, France.