'Tactile internet' presented at CeBIT

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The coordinator of the Center for Advancing Electronics Dresden, Professor Gerhard Fettweis, is heading a common initiative by German research institutes and industrial companies presented at the German computer fair CeBIT in Hannover on March 10th, 2014. Globally, multi-billion amounts are invested in this area of research - e.g. by the notion of 5th Generation of Mobile Communications.

"It is nothing less than a new level of the digital revolution", Professor Gerhard Fettweis, Vodafone Chair Mobile Communications Systems of Technische Universität Dresden, says. The coordinator of the Center for Advancing Electronics Dresden (cfaed) is heading a common initiative by German research institutes and industrial companies presented at the German computer fair CeBIT in Hannover on March 10th, 2014. Globally, multi-billion amounts are invested in this area of research – e.g. by the notion of 5th Generation of Mobile Communications (5G).

To drive this initiative forward and to develop the superfast mobile internet standard 5G, a collaboration between Technische Universität Dresden, King's College London, and the University of Surrey is planned.

The cross-sectional significance of future digital infrastructure far-reaching beyond mobile communications and the competition on technological leadership are internationally highly prioritized. Innovations in areas such as engineering, automobile, transport and logistics, health service, and public administration can only be developed sustainably in Germany and Europe if they are advanced, tested and used

at the location.

"The further development of European technological leadership in the area of network technologies is – as the NSA-activities have clearly shown - not only an economic necessity", the coordinator of the TUD Cluster of Excellence emphasizes. "The cross-area character of the future communication infrastructure requires a leading role of the German and European research and development in this area, based on international standards."

Coordinated research support is particularly important in the following areas:

- new radio access networks which fulfil resource-efficiently highest demands to the end-to-end latency, resilience, and robustness.
- network- related security conception which contains user-adapted ideas for privacy protection.
- innovative and adaptive network architectures based on Mobile Edge Clouds, and
- sensors and actuators for the tactile application of the next generation.

These technology-driven research activities must be complemented by interdisciplinary programs which bring together users with highest demands and technology developers.

What 'tactile internet' means for society:

Education, further training, lifelong learning:

Modern learning methods such as E-Learning, Blended-Learning and Massive Open Online Courses, but also motion simulators could be

extended by interactive elements, which could reach far beyond current simple embedded tests or playful didactic elements. Due to the extremely small delays, it will be possible in future to overlap teachers and learners what will lead to a completely new learning experience, especially in the training of finely motoric capabilities.

Medicine: The connected expertise of medicines at tele-diagnosis and treatment as well as the tactile feeling of experienced operators in connection with high three-dimensional precision of robot-based tele-operators, also over distances, has as a result a qualitative improvement at a multitude of interventions. Moreover, it supports disabled or elderly people with prostheses or power amplifier on the basis of exoskeleton to a higher mobility and enable them a self-determined life over a longer period of time. Personal security environment: The tactile internet allows the establishment of a personal three-dimensional security zone interacting with other objects in the environment. In public traffic e.g., a higher security for children or elder people can be reached, when vehicles realize critical situations fast, react according the situation and alert other traffic participants in their environment. A higher work security can be reached in other production environments when connected production facilities can avoid contact with people and therefore prevent accidents.

Traffic control: The interconnection of vehicles allows cooperative traffic systems which enlarge the driver horizon and allow the control of the individual traffic by consideration of local danger potential and macroscopic traffic parameters, e.g., the traffic density in city centers. Therefore, the traffic security and traffic efficiency could be sustainably improved and the accident numbers and after all the number of traffic victims can be reduced. With the tactile internet, vehicles can communicate substantially faster than with existing systems for local alert. Thus, cooperative security applications for automatic collision avoidance are, for instance, supported. New ways of traffic such as

automatic driving or column driving allow a continuous and energy-efficient [traffic](link) flow.

Energy transition and energy supply: In local energy networks, the Tactile Internet allows to control consumers and energy performance precisely and to minimize reactive power. It is a functional enlargement of Smart Grids and contributes to the improvement of energy-efficiency and service security.

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