



Gearing up wireless technology

With a new university laboratory, researchers can boost their experimental work with wireless technologies for future networks that effectively and rapidly communicate large amounts of data.

Aarhus University has established one of the world's most advanced wireless transceiver laboratories, which will help researchers to create new knowledge about future wireless technologies operating at extremely high frequencies in both microwave and millimeter-wave spectra.

One of their most notable research objectives is to develop new radio technologies and thereby devices and methods to transfer large amounts of mobile data at significantly higher speeds than is possible today.

The laboratory is equipped with state-of-the-art technology that includes vector network analysers, signal spectrum analysers, micro-probing stations, noise figure meters, and a noise signal source – all of which can help investigating and solving major scientific challenges regarding future wireless connectivity and contactless sensing applications.

“Working with high frequencies requires specialised and expensive equipment, and it is absolutely crucial for being at the forefront of developing the technologies that can unfold the full potential of the Internet of Things in the time ahead. Our greatest innovation challenge is to create high-capacity, energy-efficient wireless transceivers that can enable data transmissions from several devices at a mag-

nitude we can't do today. We're heading towards a future Internet with high-volume data traffic where machines sense physical parameters of the surrounding environment, communicate with each other and exchange data, thereby making an unprecedented amount of distributed intelligence and automation possible,” says Professor Domenico Zito.

Playground for the IT talent of the future

Professor Zito is in charge of the laboratory which came about as a result of financial support from the Poul Due Jensen Foundation (the Grundfos Foundation) and the American multinational company Keysight Technologies. Both of these are important industrial partners, and they share the university's interest in supporting talented researchers and innovators to create a leading international knowledge environment in wireless technology and its applications to address real-world problems and emerging industrial needs.

“We have received an outstanding support from our industrial partners. It is absolutely crucial for our future research that we have access to the most advanced experimental facilities. This is also very important for our ability to educate next-generation engineers in this strategic area for society and economy,” says Professor Zito.

The new laboratory will ensure that the engineering graduates of the future have experience with radio technology development for emerging wireless networks and communications.

Wireless technology monitors babies' breathing

One of the wireless transceiver technology's many application areas is contactless sensing, and the Aarhus University researchers already have a number of interesting projects behind them. These include the development of a contactless sensor that can detect and monitor people's breathing rhythms. With a prototype size corresponding to a grain of sand, it is now ready for commercialisation.

“The sensor detects respiration rate by tracking the chest movements while the person is breathing. We've carried out both in vitro and in vivo tests on children and adults, and we have got the proof of concept that we can manufacture efficient sensors for contactless body monitoring,” says Professor Domenico Zito.

Read more at www.eng.au.dk