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Nokia Research Center

Nokia Research Center (NRC) is chartered with exploring new frontiers for mobility, solving scientific challenges to transform the converging Internet and communications industries. Founded in 1986, NRC is Nokia's corporate research unit and as part of Corporate Development, drives Nokia's position as a technology thought leader.

NRC consists of a global research network with some 500 people operating from 13 locations worldwide: Berkeley, Cambridge, Hollywood, and Palo Alto, USA; Cambridge, UK; Lausanne, Switzerland; Helsinki and Tampere, Finland; Nairobi, Kenya; Bangalore, India and Beijing, Shenzhen in China.

NRC collaborates on research projects with leading universities, research institutes and other technology companies around the world in the mode of open innovation. This network of over 130 partners includes Framework Research Agreements with leading universities such as the Massachusetts Institute of Technology (MIT), Stanford University, the University of California, Berkeley and the University Southern California (USC) in the USA; Cambridge University in the UK; Ecole Polytechnique Federale de Lausanne (EPFL) and Eidgenössische Technische Hochschule Zürich (ETHZ) in Switzerland; Aalto University, Tampere University of Technology (TUT) and University of Tampere (UTA) in Finland; Tsinghua University and the Beijing University of Post and Telecommunication (BUPT) in China.

To deliver new insights and drive future success for Nokia, NRC's research portfolio focuses on the following four areas:

- Sensing and Data Intelligence - Interactions between people and their surroundings, location, and social environment provide the basis for new classes of services in areas such as traffic, health and entertainment, enabling new business models to emerge.

- New User Interface - Future user interfaces will utilize intelligence and context-awareness to enhance user experiences, integrating the personalized and adaptive aspects of devices with data-sharing capabilities.

- High Performance Mobile Platforms - Research focuses on improving the performance-to-power ratio, delivering new sensing capabilities as well as extending platform architecture to enable interoperability and facilitate application development.

- Cognitive Radio - Research in this area examines ways to utilize wireless spectrum dynamically to improve connectivity and capacity and enable large-scale sensing.

Each of the NRC research laboratories concentrates on one or more of these research focus areas.

Recent NRC projects include:

Nokia Instant Community

- Recently publically demonstrated for the first time, Nokia Instant Community is a new, immediate way for communities to socially interact when in close proximity, without the need for WLAN infrastructure or Bluetooth and cellular connections. Nokia Instant Community is a disruptive technology which allows devices to connect to each other directly and continuously without the need for a server or

specific infrastructure. It uses a device's WLAN chip in a power efficient way to connect and create an independent network. This project is part of NRC's ongoing research into cognitive radio and is built on more than two decades of academic research into radio technologies.

Morph

- Morph is a concept that demonstrates the ultimate functionality that nanotechnology might be capable of delivering: fully flexible materials, a revolutionary self cleaning shell and transparent electronics – developed through a scientific partnership between Cambridge Nanoscience centre and NRC Cambridge, UK for a the Museum of Modern Art in New York. Every element of the Morph concept represents individual areas already being researched by NRC, together with the Cambridge Nanoscience centre. In addition to receiving more than 2 million views in two weeks on YouTube, Morph was awarded the red dot: design concept 2008 – an internationally recognized prize for highest quality design, and the Nokia Research Center in Cambridge won the UK Nordic Business award for Research and Development 2010 for its pioneering studies into the use of nanotechnology in mobile devices and its commitment to collaborative research in the UK.

About NRC

Further information on Nokia Research Center, its research focus areas and geographical locations can be found at: http://research.nokia.com.

For more information on Nokia Research Center engagement with external collaborators and an update on its Open Innovation initiative, visit: http://research.nokia.com/openinnovation