



Flexible Air iNTErFace for Scalable service delivery wiThIn wIREless Communication networks of the5th Generation

FANTASTIC-5G

MAIN OBJECTIVES

FANTASTIC-5G objectives are:

1. to develop a flexible and scalable multi-service air interface
2. with ubiquitous coverage and high capacity where and when needed
3. being highly efficient in terms of energy and resource consumption
4. being future proof and allowing for sustainable delivery of wireless services far beyond 2020.
5. To evaluate and validate the developed concepts
6. and build up consensus on reasonable options for the standardization of 5G.

The project deals exclusively with lower carrier frequencies (< 6 GHz).

USE CASES (or APPLICATIONS)

5G is mainly about two ambitions:

1. Respond to the strong growth of requested data rates (evolutionary effect)
2. Enhancing the business model of operators by widening the pool of services (revolutionary target).

While supporting the former, FANTASTIC-5G targets to make the latter a reality. For doing so the project has set up 5 core-services which either in itself or by combination realize real-world use cases. The key differentiator between these core services are the respective service defining KPIs:

1. Mobile Broadband (MBB): throughput/ user rate, latency, mobility
2. Mission Critical Communications (MCC): latency, reliability/availability
3. Massive Machine Communications (MMC): number of connected devices, low cost, low energy
4. Broad- and Multicast Services (MBS): number of connected devices
5. Vehicle-to-Vehicle and Vehicle-to-Infrastructure Services (V2X): high mobility

A key element common to all the core services is ubiquitous coverage.

TECHNICAL AND RESEARCH CHALLENGES

The main challenge for FANTASTIC-5G is to develop a modular air interface which is able to support all the anticipated use-cases with highest efficiency and scalability without being overly complex on the network side. To this end, the project will develop the technical AI components (e.g. flexible waveform and frame design, scalable multiple access procedures, adaptive retransmission schemes, enhanced multi-antenna schemes with/without cooperation, advanced multi-user detection, interference coordination, support for ultra-dense cell layouts, multi-cell radio resource management, device-to-device) and integrate them into an overall AI framework where adaptation to the high degree of heterogeneity 5G will face will be accomplished. Our work will also comprise intense validation and system level simulations. The ambition is to outperform a system involving dedicated air interfaces.

EXPECTED IMPACT

Many key players participating to 3GPP standardization are collaborating within the project. So, FANTASTIC-5G is well positioned to strongly facilitate the (pre-)standardization process for 5G by comprehensively comparing technology options and starting to build up consensus.

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Partners:

Alcatel-Lucent AG, Orange SA, Aalborg University, CEA-LETI, CTTC, Fraunhofer HHI, Huawei ERC, Intel Deutschland GmbH, Nokia, Politecnico di Bari, Samsung Electronics UK, Sequans Communications, Institut Mines-Telecom/Telecom Bretagne, Telecom Italia S.p.A., University of Bremen, WINGS ICT Solutions

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