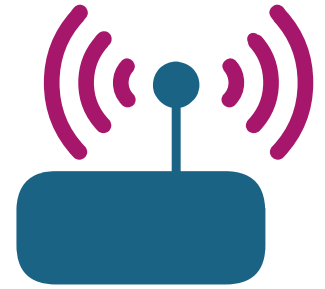


Paving the way for the mobile access of the future

Ever since GSM (Global Systems for Mobile Communications) extended the accessibility of mobile phones to almost every member of our society, the drive for wireless communications has been relentless. This has, however, put enormous pressure on the **provision of the essential resource needed for wireless information exchange – the radio spectrum**. As a result, the radio spectrum – initially a wireless facilitator – has now become a bottleneck. Ironically, it is this same spectrum which often inhibits the innovation of new services and impacts on the outreach, capacity and quality of service of current wireless communications systems.



The intelligence behind radio

In recent years, one of the most significant developments in wireless technology has been the movement toward the realisation of **Cognitive Radio (CR) systems**. CR adds intelligence to radio components, enabling them to understand and adapt themselves to the environment they operate in. This technology would allow us to simultaneously address two contradicting requirements – a more efficient use of spectrum by existing systems, and providing better possibilities for new, innovative wireless systems to get on the air.

CR, however, requires **radio regulations** to be correctly defined to allow it to operate in the most efficient and beneficial way, both in technological and financial terms. While the CR technology itself is currently being developed and tested by many research consortia and various companies, **the research into the socio-economic and regulatory aspects, which would facilitate the uptake of this technology is largely missing**. This gap needs to be filled.

COST Action TERRA aims to bring together technical and economic experts to identify viable usage scenarios and to inspire favourable regulatory conditions for CR technologies. The Action will achieve these goals through the creation of an optimised regulatory framework.

TERRA currently includes participants from 19 European countries, as well as representatives from the European Commission, the European Conference of Postal and Telecommunications Administrations (CEPT) and individual research institutions in Canada and South Africa. TERRA also holds cooperation agreements with various standardisation bodies (the European Telecommunications Standards Institute (ETSI) and the Institute of Electrical and Electronics Engineers' Dynamic Spectrum Access Networks (IEEE DySPAN), as well as industry consortia (the Wireless Innovation Forum).

CR is a new breed of radio communications devices that will be aware of their environment and could thus adjust their operational capabilities 'on the fly' through intelligent consideration of that environment as well as past experience. This will allow them to achieve **maximum data throughput while facilitating ease of deployment, without costly prior planning.**

To telecommunications consumers at large, **this technology would mean availability of increasingly pervasive, more versatile and faster wireless services at ever lower costs.**

For policy-makers in the field, as well as European regulators and regulatory/standardisation bodies (e.g. the European Commission, CEPT and ESI) **TERRA will develop a comprehensive techno-economic regulatory framework outlining radio spectrum access rules for Cognitive Radio and provide assistance in the form of know-how and expertise.**

Recently, the EU's Radio Spectrum Policy Group (RSPG) in its Opinion on Cognitive Technologies recognised COST-TERRA as a suitable basis for building "a platform [...] to allow researchers, academia, manufacturers, operators, service providers and regulators to coordinate research activities" on this crucial technology that has EU-wide policy and markets impact.

(Ref. RSPG10-348, 10-Feb-2011)

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TERRA has provided valuable input on topics such as the categorisation of CR use cases and applications; proof-of-concept testing arrangements, including the new concept of dedicated test band; the co-existence and efficiency of resource usage by CR; and the analysis of the viability of CR business scenarios.

COST is Europe's longest-running intergovernmental framework in science and technology cooperation, providing funding for research networking projects called 'Actions'. Supported by the EU's 7th Framework Programme, COST mobilises and connects extraordinary scientific potential, within Europe and beyond.

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