PROJECT PROFILE

CA116

Resolving interference issues means more 'concurrent' and new wireless products and applications [CORTIF]

With some seven trillion wireless devices expected to be deployed by 2020, the CORTIF (Coexistence Of Radio frequency Transmission In the Future) project will ensure that they will be able to function properly and without detrimental mutual interference. CORTIF will achieve this by defining system requirements and constraints, developing technical approaches and demonstrating working proof-of-concept solutions.

Current wireless devices are equipped with increasingly more radios, and there are many situations in which users would like to operate them simultaneously. When this happens, it is essential that these devices operate without detrimental mutual interference. Furthermore, we are moving towards a smart environment in which intelligent devices that interact with users, sense their environment and communicate with each other, often with no human intervention. Some of these devices are fixed, others nomadic, but all must communicate increasingly wirelessly in order to meet their design objective.

Traditional approaches of simply increasing either transmission power or receiver selectivity are stretched by the demands of an increasingly cluttered spectrum. Even approaches that are designed to accommodate this issue of radio frequency (RF) clutter (like spread spectrum, frequency hopping, and forward error correction) are facing challenges as more and more systems move to wire-free communications. To avoid a complete wireless traffic jam in the near future, it is essential to improve data-transfer reliability and signal range of current and future devices, and at the same time quicken the introduction of new wireless products.

Crucial coexistence in wireless communications

CORTIF will achieve the concurrent use of RF spectrum by multiple, independent radio systems without harmful mutual interference. The project will consider two coexistence scenarios: proximity and collocation. Proximity refers to the case where devices are not on the same platform but are close enough that they could interfere if operated simultaneously. Collocation is the case where multiple radios are in the same physical unit. Collocation causes new interference modes due to conduction effects as well as radiation, but also potentially allows more mitigations as the physical spacing between interfering elements is fixed. CORTIF will address some of the core problems to support coexistence and communications of devices and systems in these two scenarios.

Key project goals are to:

- Create the next generation of European wireless communication systems by developing new methodologies for RF design and simulation tools;
- Focus these methodologies on co-existence, robustness and low cost as a prerequisite for future radio technologies;
- Target the whole value chain, starting with component and system design, to complete demonstration systems.

European team-effort

CORTIF addresses the 'Communication & Digital Lifestyles' work-area of the CATRENE programme. By facilitating the coexistence of multiple wireless communications, it supports the European effort to deploy wireless applications (despite the saturation of available RF spectrum) by:

- Introducing a flexible and energy efficiency design architecture, and thereby addressing CATRENE's Grand Challenge 3 'Self Organizing Network'. This is underscored by the design of advanced internet of things (IoT) transceivers, and CORTIF's system ability to handle multiple protocols on a single device;

PROJECT CONTRIBUTES TO

- Communication
- Energy efficiency
- Digital lifestyle
- Design technology

PARTNERS

NXP Semiconductors (NXP-FR)
AIRBUS DS SAS
GS LDA
Institut Mikroelektronických Aplikací s.r.o. (IMA)
NXP Semiconductors (NXP-NL)
Technicolor
Technolution B.V.
Brno University of Technology (BUT)
Institut Mines-Telecom (IMT)
Instituto de Telecomunicações (IT-PT)
Stichting IMEC Nederland (IMEC)
Technische Universiteit Eindhoven (TU/e)
Xlim
UPC - Universitat Politecnica De Catalunya

COUNTRIES INVOLVED

- France
- Portugal
- Czech Republic
- The Netherlands
- Spain

PROJECT LEADER

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KEY PROJECT DATES

01/07/2014 - 30/06/2017

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- Considering the dynamic flexibility of the RF frequency allocation. Here, CORTIF responds to the demand for network protocols to possess self-organising capabilities. This addresses CATRENE's Grand Challenge 4 'Short-range convergence';

- Focusing on communication technologies and systems critical for Europe to fully reap the economic and social benefits of a future IoT, as envisioned by Bernard Barani, European Commission DG CONNECT, in the Horizon 2020 programme.

Crucially, the project needs Europe to make it work. The multifaceted impact and the important goals pursued by CORTIF cannot be met by means of individual national research programs, or through particular projects developed by a single company. The scope of the project makes pan-European collaboration and the participation of 14 key European players from industry, research and academia in critical areas of CORTIF indispensable.

Economic, social and technical spin-offs

Improving data-transfer reliability and signal range will strengthen European manufacturers' position in their market, and will accelerate the business ramp-up of new wireless products. By supporting the coexistence of wireless communications in connected objects through IoT, set-top boxes (STBs), TV tuners and professional mobile radio (PMR) – markets in which Europe leads – CORTIF will consolidate Europe's position in these and other new wireless-service markets. In addition, by proposing appropriate technical solutions for the coexistence of the RF spectrum sharing, the European standardisation bodies will get more flexibility to rule on frequency allocations. Europe's competitive advantage is the complete development platform combining network control and drivers as part as home automation and an increased security feature. CORTIF project will add a decisive advantage with its coexistence techniques, especially over American semiconductor suppliers, Europe's main competitors.

CORTIF will also have a healthcare and societal impact. A case in point is body-signals monitoring through the use of low-power wireless technologies, one of several expected social impacts these technologies will have on healthcare.

There is more. Not only will this project result in a significant market-share increase for large European semiconductor companies within the whole wireless communication market; it will also demonstrate Europe's capability to develop leading-edge technology. Furthermore, high-tech, small and medium-sized enterprise project participants will provide significant added-value to the complete supply chain. And universities and institutes will remain at the forefront of this advanced technology, delivering the appropriate graduates and research to solve industry's problems.

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