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Introduction

- Wireless systems are becoming increasingly complex due to higher efficiency requirements.

- Cognitive radios and cognitive wireless networks have recently been proposed as a new paradigm to reduce this complexity.

- However, much of cognitive radio research has still been very conceptual, with few facts known about the real potential of such systems.
Project Objectives

- The key objective of FARAMIR is to move the state-of-the-art in cognitive radios to factual engineering science and business.

- We believe the main enabler for this is providing increased radio environmental and spectral awareness for cognitive radios.

- The project plans to achieve this by developing first concrete reference architecture and implementation for Radio Environment Maps.
Key Issues (I)

- The core task is the development of the Radio Environment Map (REM) reference architecture

- REMs will serve as a foundation of comprehensive technology chain for measuring, collecting, and representing spectrum data, all developed in the project

- The benefits of applying radio environmental information in resource management will also be studied through prototype implementations
Key Issues (II)

- The REM work will be strongly tied to cognitive radio resource management both for primary and secondary systems.

- New spectrum sensing algorithms and hardware will also be developed and prototyped.

- Project will also carry out extensive spectrum use measurements and will make the date sets gathered publicly available through a dedicated web portal.
Project Structure and Work Items

**Resource Management and Optimization:**
- Exploits the information listed in the REM
- Provides improved configuration for each node
- Manages spectrum use
- Minimizes interference
- Optimizes protocol parameters
- etc.

**Cooperatively Constructed Radio Environmental Map:**
- Describes spectrum use
- Incorporates measurements from all nodes
- Includes mapping of interference sources
- Includes locations of participating nodes
- etc.

**Neighbourhood Mapping component:**
- Identifies interference sources
- Provides location estimates for those

**Spectrum Sensing Engine:**
- Enhanced sensing algorithms
- Specifically designed hardware
- Low power consumption
In total ten partners work in the project, based on nine different countries.

The consortium represents a strong collaboration between academia and industry, consisting of top groups in the field.

The partners also have strong contacts to standardization groups including ongoing work towards DSA and cognitive radio standardisation.
Expected Impact

- The project aims at enhancing competitiveness of European industry in the areas of wireless devices, networks and new applications
  - Industry-driven scenario work will play key role in this

- Developed radio environment map tools and methodologies will be published, including results obtained from extensive spectrum use measurements

- Project will also actively contribute to standardisation in the emerging technology area of cognitive radios
  - SCC41/P1900 and ETSI specifically targeted