



WIRELESS COMMUNICATIONS

Research and Development Areas



Spain – USA – Taiwan

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- A practical case: AT4 wireless

R&D TECHNOLOGICAL AREAS OF INTEREST IT Companies





Plataforma Tecnológica Española de Comunicaciones Inalámbricas



STRATEGIC RESEARCH AGENDA

- ✓ eMOV is a cooperation network of entities interested in wireless communications. 320 member at present
- ✓ The Strategic Research Agenda (SRA) describes the current research lines in wireless communications in Spain.
- ✓ It has been developed by all interested members parties (academia, technological centers and enterprises).
- ✓ 9 main research fields of interest in wireless communication in the Spanish industry has been identified.

Vehicular Networks and Services

Cognitive Radio Networks.

**Radio Coverage for Indoor / Outdoor
Communication Systems.**

**Mobile Services and Applications for
Tourism.**

Relevant Services in Mobility.

Wireless Sensor Networks.

Green IT.

Future Internet

International Cooperation

eMOV STRATEGIC RESEARCH AGENDA

■ Vehicular Networks and Services.

- ✓ Services.
 - Anti-collision, contextual information, social networks, “green car”
- ✓ Communications.
 - VANET (protocols, security privacy), NGN, M2M.
- ✓ Media.
 - Radio technologies (antennas, propagation models, standards V2V e.g. IEEE 802.11p)
- ✓ On-board equipment .
 - OBUs, Car PCs, smart phones, HMI, ITS
- ✓ Field operational tests.
 - Certification, interoperability, validation.

eMOV STRATEGIC RESEARCH AGENDA

■ Cognitive Radio Networks.

- ✓ Performance and Theoretical characterization.
 - Physical Layer, spectrum sensing and modulation techniques, interferences.
- ✓ Cognitive Networks.
 - MAC protocols, traffic modeling, routing, security issues.
- ✓ Hardware implementation
 - Sensing capabilities, reconfigurability and cognitive control and management.
- ✓ Standardization and Testing.
 - European and International Standards, Simulation tools, testbed design.

eMOV STRATEGIC RESEARCH AGENDA

■ Radio Coverage for Indoor / Outdoor Communication Systems.

- ✓ Coverage simulation methods.
 - Wave and geometrical evaluation algorithms, artificial intelligence and neuronal networks, iterative computing.
- ✓ Fast Computing.
 - Parallel computing, coprocessors computing.
- ✓ MIMO Systems
 - Propagation, radiant systems, radio over optical fiber.
- ✓ Terminals and Network connectivity and interoperability.
 - radio coexistence, automatic updating, user profile management.
- ✓ Communications Networks
 - Indoor Networks, RFID
- ✓ Electromagnetic radiation and environment.

eMOV STRATEGIC RESEARCH AGENDA

■ **Mobile Services and Applications for Tourism.**

- ✓ Smart Cities.
- ✓ Smart Hotels.
- ✓ Location Based Services
- ✓ Content creation, management and delivery.
- ✓ Accessibility and new IHM interfaces
- ✓ Definition of wide impact applications.

■ **Relevant Services in Mobility.**

- ✓ Contextual services
- ✓ Mobile service provision
- ✓ Mobile terminal virtualization
- ✓ Mobile payments
- ✓ Services for smart cities
- ✓ New paradigms in interpersonal communications
- ✓ Extension of the mobile terminal

eMOV STRATEGIC RESEARCH AGENDA

■ **Wireless Sensor Networks.**

- ✓ Hardware y Software.
- ✓ Networking and Protocols
- ✓ Sensors and Actuators.
- ✓ RFID and Mobility
- ✓ Synchronization and security
- ✓ Applications

■ **Green IT.**

- ✓ Green Radio
- ✓ Green Networking
- ✓ Applications to networks facilities (water, electricity)
- ✓ Waste management
- ✓ Other applications for environmental management.

eMOV STRATEGIC RESEARCH AGENDA

■ **International Cooperation.**

- ✓ Increase competitiveness of Spanish Innovation system.
- ✓ Increase partnerships in international programs

■ **Future Internet.**

- ✓ Telecommunications Networks
- ✓ Content Services
- ✓ Internet of Things (IoT)
- ✓ Security

AT4 wireless R&D

AT4 wireless is a global supplier of **Testing Services and Solutions** for communications and information technologies industries .

AT4 wireless develops cutting-edge technology to support its wide range of **Test Systems** for mobile and wireless technologies and its **IT solutions**.



Testing Services

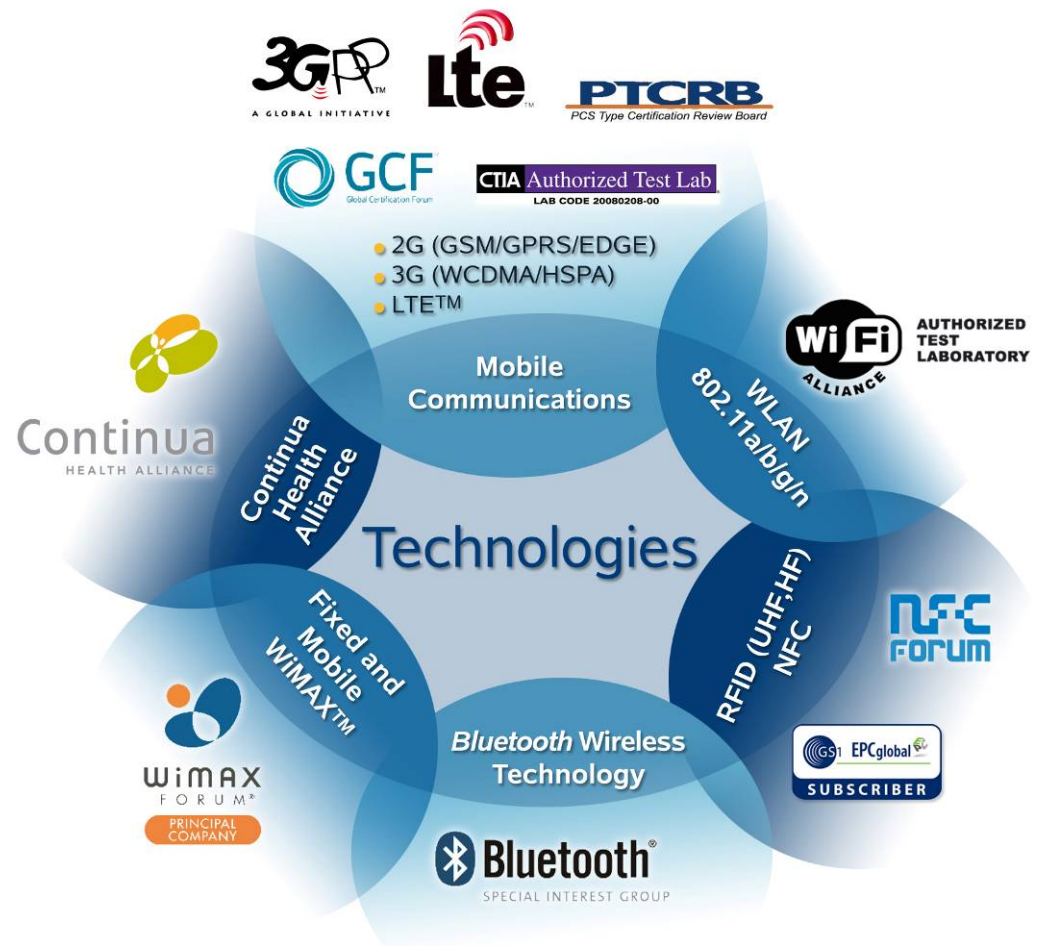
- Telecommunications
- Renewable Energies
- Electrical & Electronic
- Medical & Health
- Game & Slot Machines

Test Systems

- Research & Development
- Design & Verification
- Conformance

IT Solutions

- Cost Efficiency Solutions
- Mobile Solutions



AT4 wireless Global Presence



R&D Projects



Logistic Solutions

- Shipping System
- Tracking System
- Location of Goods System
- Warehouse Management

Healthcare Solutions

- Identification of patients and drugs
- Locate personnel
- Patient monitoring
- Information management
- Energy management



European Programs

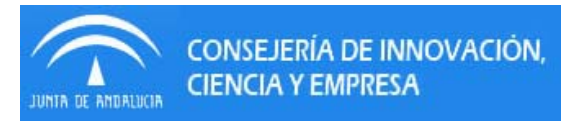
- Framework Program 7 (FP7)
- Ambient Assisted Living (AAL)
- EUREKA



National Programs



Regional Programs



Research Projects Areas



WSN



Future Internet



Vehicular Network



Green IT



Relevant Services in Mobility



Cognitive Radio



AT4

Mobile Communications Technologies

(LTE/LTE-A, WiMAX, Femtocells, SDR, DSP, Convergence, ...)

Intelligent Transport Systems (ITS)

(eCall, V2V, V2I, ...)

Internet of Things

(RFID, NFC, Wireless Sensor Networks, M2M, ...)

e-Health

(Patient remote monitoring, Telemedicine, Digital Hospital, ...)

Testing Technologies

(TTCN-3, Conformity, Interoperability, Performance, ...)

(PKI, Authentication, Access control, ...)

Security

Spain

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