Main Topic

* Optimized strategy for reliable in-vehicle communication, vehicular connectivity and localization

Scientific Approach

Understand physical phenomena to help in the development of electronic/telecommunication systems

- Wire and wireless channel characterization: modeling / measurement
- Signal processing: robust channel estimation
- EMC in electrically large structure and novel methodologies for EMC tests

PLC in "More Electrical" vehicle, emphasis on aircraft (MEA)

Need of additional communication network while not increasing cables weight. Not possible to directly apply indoor PLC technologies because of specific in-vehicle EMC standards, complex cable harnesses and presence of impulsive noise.

- EMC and channel characterization
- Simulation of PHY layer
- Feasibility and performances of in-vehicle PLC
- Demonstrator with reconfigurable PLC modems
- Health monitoring

High resolution localization technique in non line of sight (NLOS) outdoor and indoor environment

- Outdoor: mobile to dedicated localization stations
- Indoor: Mobile to anchor (MIMO context)

Novel technique based on fingerprinting + High resolution algorithm and metric that matches 3D-ray launching and experimental signal signatures taking polarization diversity into account.

Societal Challenges: Smart, green and integrated transport; Secure societies - protecting freedom and security of Europe and its citizens.

Context: Int. Campus on Safety and Intermodality in Transportation (CISIT), i-Trans competitiveness cluster, IRT Railenium.

Collaboration: Safran, Airbus, EADS, Thales, Messier-Bugatti, SNCF, Alstom, RFF, SIRADEL, UPCT (ES), Mucra Univ. (ES), ULB (BE), Gent Univ., Mons Univ. (BE), Libanese Int. Univ. (LB), Leeds Univ. (UK), Politec. di Torino (IT), EPFL (CH).