DRIWE
Dependable RF Communication Systems for In-Car Wireless Sensors

Pro²Future

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MOTIVATION & GOALS

- Dependable reliable wireless communication the goal of any sensor-based system
- Wireless systems are very difficult to implement in certain environments
- Attain **reliable** wireless communication systems in **harsh environments**
- Systems can be **tailored** and **automated** towards specific harsh application environments
- Use accurate **EM simulation models** to estimate wireless communication parameters
- Achieve a **high reliability** and **throughput** based on simulations
- Validation of simulated data in **real environments**
- Software **tool** that gives **parameter recommendations** for each individual scenario

Project FactBox

Project Name DRIWE
Project ID MFP 4.1.3-1
Duration 36 Months

Area 4.1
Cognitive Products

Project Lead
Dr. Konrad Diwold

APPROACH

Evaluation of existing systems and components by measurements and simulations
Verification of results in real testbeds
(demonstrator setup & engine compartment)
Implementation of a Matlab/Simulink model to simplify the whole calculation process
Creation of a **cognitive tool** with generated results
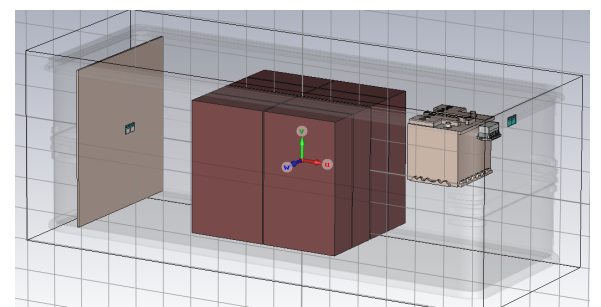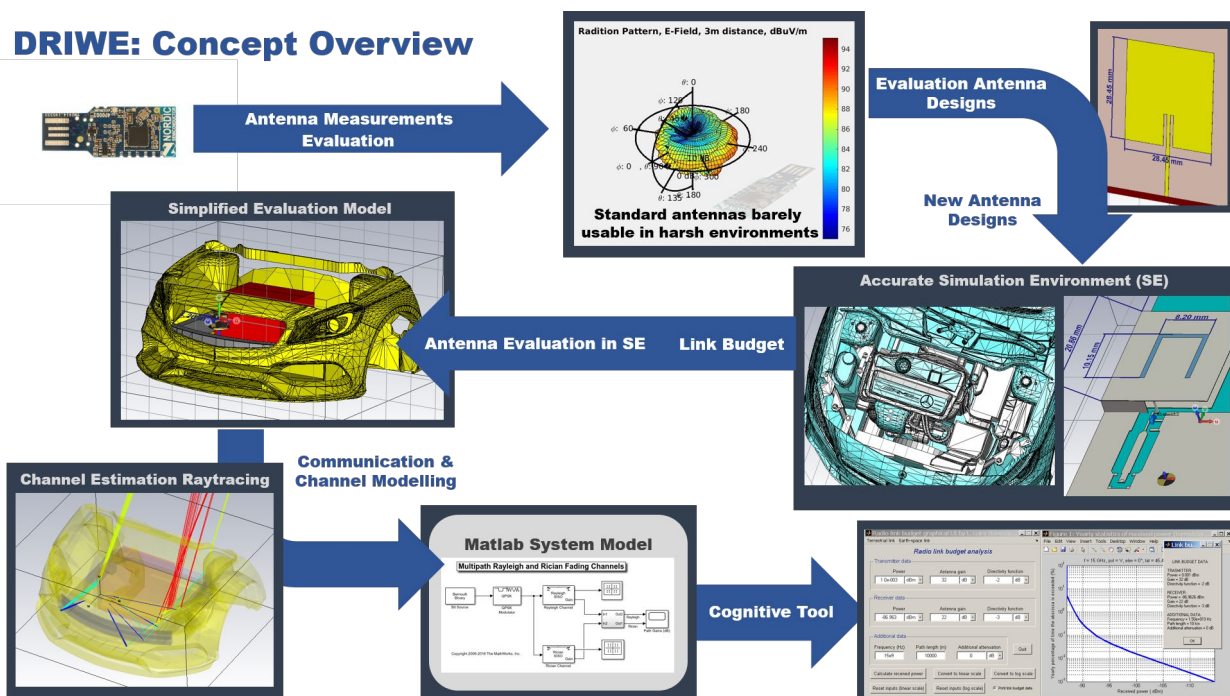
CONTRIBUTION

Scientific contribution
Development of new methods to optimize a wireless communication system and all the required parameters in a harsh environment. The methods are applicable for a wide range of industrial applications.
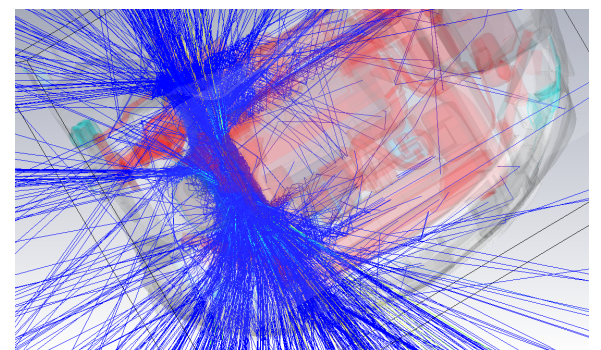
Economic contribution
The resulting cognitive tool will enable technicians to pick the best components and positions for wireless communication systems without the requirement of additional expertise.

SYSTEM ARCHITECTURE

DRIWE: Concept Overview

Antenna Measurements Evaluation

Radiation Pattern, E-Field, 3m distance, dBuV/m

Standard antennas barely usable in harsh environments

Evaluation Antenna Designs

New Antenna Designs

Simplified Evaluation Model

Accurate Simulation Environment (SE)

Antenna Evaluation in SE — Link Budget

Channel Estimation Raytracing

Communication & Channel Modelling

Matlab System Model
Multipath Rayleigh and Rician Fading Channels

Cognitive Tool

Radio link budget analysis

Simulation setup of the demonstrator box

Raytracing applied in an engine compartment model

AVL

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