

PROJECT

MOSARIM

MOre Safety for All by Radar Interference Mitigation

Funding: European (7th RTD Framework Programme)

Duration: Jan 2010 - Dec 2012

Status: Complete with results

Total project cost: €4,785,310

EU contribution: €2,897,173



Call for proposal: FP7-ICT-2009-4

[CORDIS RCN : 94234](#)

Background & policy context:

Since a number of years, millimeter-wave radar systems are being used for vehicular applications, predominantly in comfort functions, sometimes in safety functions. Different frequencies and modulation schemes, emission powers, and radiation patterns are being used, but so far hardly any measures or precautions had been taken to reduce or avoid mutual interference.

Within a few years the penetration rate of vehicular radar systems will have drastically increased in this new emerging market, and for safety-related applications especially the interference risk will threaten further proliferation if harmful mutual interference pops up. Trying to find efficient and pragmatic countermeasures to avoid the apparent interference risk at that point where severe interference problems creating malfunction or out-of-order situation of the safety radar devices have become reality, is too late. The only reasonable and valid approach is to counteract in advance, before the problem becomes manifest.

Objectives:

As there was almost no regulation regarding radar interference mitigation for automotive radars, this research project aimed to generate a first assessment, a common understanding of the interference effects and problems, and a first set of recommendations and guidelines to avoid inefficient interference troubleshooting at a later stage.

A well-selected consortium of specialists from all disciplines necessary to realize the project aims, became operational and prepared to tackle the demanding challenges. The project outcomes and results were vitally important for a long-standing success of radar-based devices for automotive systems.

The results of this project also laid the foundation for taking further steps in reducing the number of grave or fatal accidents caused by vehicles, after the EC forced all OEM's to make ESP mandatory in new cars. Missing the results that would be achieved within this project, would have had a severe and strong impact on the vehicular radar roadmap beyond 2015.

Methodology:

The methodology was broken down as follows:

1. Assessment on actual radar interference potential with of-the-shelf radar sensors;
2. Generation of a starting platform based on common understandings and state-of-the-art;
3. Elaborate comprehensive and realistic simulation models regarding radar interference;
4. Specification and implementation of a norm radar interferer for automotive radar interference tests;
5. Find common applicable interference countermeasures to reduce mutual radar disturbance;
6. Generation of recommendations and guidelines for vehicular mutual radar interference mitigation.

Parent Programmes:

[FP7-ICT - Information and Communication Technologies](#)

Institute type: Public institution

Institute name: European Commission

Funding type: Public (EU)

Lead Organisation:

Robert Bosch Gmbh

Address:

Robert-Bosch Platz
70839 Gerlingen-Schillerhoehe
Germany

Organisation Website:

<http://www.bosch.com>

EU Contribution: €561,625

Partner Organisations:

Valeo Schalter Und Sensoren Gmbh

Address:

Laiernstrasse
74321 Bietigheim Bissingen
Germany

EU Contribution: €232,186

Volvo Bus Corporation

Address:

Fästningsvägen 1
40508 Gothenburg
Sweden

Organisation Website:

http://www.volvo.com/bus/global/en-gb/home_new.htm

EU Contribution: €81,896

Hella Gmbh & Co Kgaa

Address:

Rixbecker Strasse
59552 Lippstadt
Germany

Organisation Website:

<http://www.hella.com>

EU Contribution: €253,257

Telefication Zevenaar Bv

Address:

Edisonstraat
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EU Contribution: €193,983

Gr-Consulting Gmbh**Address:**

Ellwangerstrasse
71732 Tamm
Germany

EU Contribution: €23,913

Daimler Ag**Address:**

Mercedesstrasse
70327 Stuttgart
Germany

Organisation Website:

<http://www.daimler.com>

EU Contribution: €313,077

Innosent Gmbh**Address:**

Am Roedertor
97499 Donnersdorf
Germany

EU Contribution: €250,380

Karlsruher Institut Fuer Technologie**Address:**

Kaiserstrasse
76131 Karlsruhe
Germany

Organisation Website:

<http://www.kit.edu>

EU Contribution: €355,208

Autocruise S.a.s.**Address:**

Avenue Du Technopole (Zac Technopole Brest Iroise - Secteur
29280 Plouzane
France

EU Contribution: €270,756

Adc Automotive Distance Control Systems Gmbh**Address:**

Kemptener Strasse 99
88131 Lindau/bodensee
Germany

EU Contribution: €267,292

European Commission - Joint Research Centre (Brussels)

Address:

Rue de la Loi 200
1049 BRUXELLES
Belgium

Organisation Website:

[Organisation Website](#)

EU Contribution: €93,600

Technologies:

Sensor technologies
Next generation imaging sensors

Development phase: Research/Invention

Key Results:

Unwanted mutual influence between vehicular radar systems may occur, similar to other environmental sensing technologies like lidar or ultrasonic. First project results indicated that the probability of occurrence is limited and influences can be counteracted. Mitigation countermeasures evaluated in the MOSARIM project so far showed to have the potential to avoid any malfunction completely.

The final conclusions on the project were:

- Noticeable interference mainly visible at closer distances;
- Wave guiding environments increase the relevant distance;
- Further increase of sensor penetration rate will not increase interference intensity but incidence;
- Most likely effect is noise increase => danger of overseeing weaker targets;
- Several countermeasures are feasible for automotive boundary conditions to reduce noise increase.

Innovation aspects

The radar interference mechanisms were first of all determined by sophisticated radar simulation models being elaborated and improved during the course of the project. Interference mitigation effects were validated both in open road tests and in laboratory environments, like e.g. anechoic chambers.

Based on ray-tracing principle and complex backscattering models, the road radar interference scenario was accurately simulated and provided a deep insight into the key parameters influencing the interference effects and strength.

Strategy targets

Innovative for the future: technology and behaviour

Integrated urban mobility

Documents:

 [Specification and characteristic of a norm interferer \(Other project deliverable\)](#)

Vehicle design and manufacturing, Other

STRIA Roadmaps: specified

Transport mode: Road transport

Transport sectors: Passenger transport

Transport policies: Deployment planning/Financing/Market roll-out, Environmental/Emissions aspects

Geo-spatial type: Other