Project Overview

Roberto, Brignolo (CRF)
Angela Spence (Mizar)
Christian Zott (Bosch)
Achim Brakemeier (Daimler)
Abdel Kader Mokaddem (Renault)

www.safespot-eu.org safespot@crf.it
General figures

**Project type:** Integrated Project (IP)
**Co-funded by:** the European Commission Information Society and Media in the 6th Framework Programme
**Promoted by:** EUCAR
**IP coordinator:** Roberto Brignolo Centro Ricerche FIAT (IT)

**Consortium:** 51 partners (from 12 European countries):
- OEMs (cars, trucks, motorcycles)
- ROAD OPERATORS
- SUPPLIERS
- RESEARCH INSTITUTES
- UNIVERSITIES

**Timeframe:** Feb. 2006, Jan. 2010
**Overall Cost Budget:** 38 M€ (European Commission funding 20,5 M€)
The SAFESPOT concept 1/3

SAFESPOT is working to design cooperative systems for road safety based on vehicle to vehicle and vehicle to infrastructure communication. SAFESPOT will prevent road accidents developing a:

“SAFETY MARGIN ASSISTANT”

to detect in advance potentially dangerous situations and extend, in space and time, drivers’ awareness of the surroundings.
The SAFESPOT Concept 2/3

...from autonomous intelligent vehicles to cooperative systems...
The SAFESPOT concept 3/3

The node’s platforms generate, store and exchange standardized information such that the nodes can individually recognize and warn about safety critical events.
The SAFESPOT Planning

2006
Requirements
Core Architecture requirements
Integration with the CVIS and Coopers architecture

2007
Specs&development
Specifications

2008
Development&test
Applications
Integration with the CVIS and Coopers architecture

2009
Test&evaluation
Results’ Analysis

SAFESPOT WATCH-OVER Workshop
Stuttgart, Jan 21-22, 2008
The SAFESPOT IP organisation

**TECHNOLOGIES And PLATFORMS**
- SAFEPROBE - IN VEHICLE SENSING & PLATFORM | BOSCH
- INFRASENS - INFRASTRUCTURE SENSING & PLATFORM | MIZAR
- SINTECH - INNOVATIVE TECHNOLOGIES | DAIMLER CHRYSLER

**APPLICATIONS**
- SCOVA - VEHICLES BASED APPLICATION | CRF
- COSSIB - INFRASTRUCTURE BASED APPLICATION | COFIROUTE

**TRANSVERSAL ACTIVITIES**
- BLADE – DEPLOYMENT, LEGAL ASPECT, BUSINESS MODEL | TNO
- SCORE - CORE ARCHITECTURE | RENAULT
- HOLA - IP MANAGEMENT | CRF

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The SAFESPOT enabling technologies

Reliable, fast, secure, potentially low cost protocols for local V2V and V2I communication

A reliable, very accurate, real-time relative positioning

A real time updateable Local Dynamic Map
The SAFESPOT Enabling technologies: ad hoc communication network

CALM
Support of ITS and Internet Services based on continuous communication over 802.11, GSM, UMTS, IR, IPv6, etc.

Car2Car protocol
For V2V and V2I communication, based on geo-aware multi-hop routing
Candidate technology: IEEE 802.11p
Need for dedicated frequency band in the 5.9 GHz. range

V2V and V2I communication for road safety and traffic efficiency applications using Car2Car and CALM technologies
The SAFESPOT Enabling technologies: ad hoc communication network

SAFESPOT, C2C-CC Layer Diagram

Wireless LAN Modem Based on 802.11a or 802.11p

LDM

SAFESPOT Network Layer (VANET)

C2C CC Network Layer

CVIS / COOPERS Applications

SAFESPOT Applications

The C2C-CC and CALM harmonization is under discussion by the two working groups
The SAFESPOT Enabling technologies: relative positioning

Reliable, very accurate, real-time relative positioning

GNSS-based Positioning (GPS, Galileo)
Communication-based Positioning (UWB, WLAN)
Image-based Positioning (Landmarks recognition)
The SAFESPOT Enabling technologies:
Local Dynamic Maps

Representation of vehicle’s surroundings with all static and dynamic safety relevant elements

- Com. nodes, fusion result
- Temporary regional info
- Landmarks for referencing
- Map from provider

Vehicles
Road side unit
Ego Vehicle
Congestion
Tree
Fog
Accident

Map from provider
The SAFESPOT Architecture
SAFESPOT in vehicle sensing and platform

- Radar Tracks available with sufficient performance
- Enough detections / limited missed detection rate
- Limited false detection rate
- No occlusion by other vehicles / obstacles
- Appropriate noise environment / limited interference
- Sufficient transmit signal power
- Strong dependence on driving scenario / event
- Limited clutter / unwanted detections (e.g. pavement, guardrails,...)

AND

- Steering angle
- Brake pedal
- Yaw rate, lat/long accelerations
- Airbag fired (PTW tilted)
- Low/high beam, fog, hazard warning lights
- Turn signal
- Wiper setting
- Global position: lat, long, velocity, heading (possibly map matched), planned route
- Doors open

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Enhanced conventional technologies as well as innovative sensing systems:

LASERSCANNER
CAMERA SYSTEM
WIRELESS SENSOR NETWORKS
RFID

To detect: vehicle presence, speed, traffic level, queues, accidents, weather conditions, obstacles on the road.
Test Sites Activities

• Test sites are a set of activities aimed to demonstrate the applications and use cases developed in the different subprojects and to proof interoperability among different countries.

• Test sites will use existing infrastructures equipped with new SAFESPOT systems and equipped vehicles.

• As far as possible general public will be involved in the test activities in order to have

• Five Test sites spread in six European countries were defined
  • IT – Italy
  • DE – Germany
  • WE - Western Europe (France & Spain)
  • NE – The Netherlands
  • SW – Sweden

• Four Test sites are shared with the CVIS IP

Demonstration Timeframe : 2009
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Thank you

Roberto Brignolo
roberto.brignolo@crf.it
www.safespot-eu.org