10 MARCH, 2008

ADOSE

Reliable Application specific Detection of road users with vehicle On-board SEnsors

European Commission
Information Society and Media

ADOSE addresses the enhancement of preventive and active safety functions through the development of high performance and low cost sensing technologies suitable for reliable detection and classification of obstacles and vulnerable road users.

At a Glance

Project:
Reliable application specific detection of road users with vehicle on-board sensors (ADOSE).

Project coordinator
1- Centro Ricerche Fiat S.C.p.A.

Partners from:
2- Robert Bosch GmbH (DE)
3- Magneti Marelli Sistemi Elettronici S.p.A. (IT)
4- STMicroelectronics Srl (IT)
5- Triad AS (NO)
6- Umicore sa/nv (BE)
7- Paragon LTD (GR)
8- Interuniversitair Micro-Electronica Centrum vzw (BE)
9- Valtion Teknillinen Tutkimuskeskus (FI)
10- Austrian Research Centers GmbH – ARC (AT)
11- Fraunhofer Gesellschaft Zur Foerderung Der Angewandten Forschung E.V. (DE)
12- Uppsala Universitet (SE)

Duration: 36 months

Total cost: 10.198.456 €

Programme:
ICT Challenge 6: Mobility, environmental sustainability and energy efficiency

Further information:
Pallaro Nereo (Project Coordinator)
Centro Ricerche Fiat S.C.p.A.
Tel: +39-011-9083401
Fax: +39-011-9083666
Email: nereo.pallaro@crf.it

Overview

ADOSE is a Collaborative Project (STREP), started in January 2008 and co-funded by the *European Commission Information Society and Media* in the strategic objective "ICT for Intelligent Vehicles and Mobility Services".
The goal is the development of high performance and low cost sensing technologies, suitable for preventive and active safety systems.
Novel concepts and sensory systems will be developed based on Far Infrared cameras, CMOS imagers, 3D packaging technologies, ranging techniques, bio-inspired silicon retina sensors, harmonic microwave radar and tags.

Challenges

ADOSE addresses research challenges in the area of accident prevention through improved-sensing technologies and sensor fusion. The focus is on functional, performance and cost limits of current sensors and Advanced Driver Assistance Systems for their extensive market penetration.

ADOSE has been set up in the context of the "European Technology Platform on Smart Systems Integration" (EPoSS) and it aims at being a product driven project by the development and integration of Smart Systems and Technologies for Preventive and Active Safety.

The goal is the enhancement of safety functions through the development of high performance and low cost sensing technologies suitable for reliable detection and classification of obstacles and vulnerable road users in hostile environments. The project is focused mainly on sensing elements and their pre-processing hardware, as a complementary project to PReVENT.

Activities

Specific objectives

ADOSE addresses five breakthrough sensing technologies, with the goal to improve the current state-of-the-art in terms of costs, performance and reliability:

❖ **FIR-add-on sensor** (FIR), with sufficiently good thermal & spatial resolution at lower cost, to be combined to a high resolution imager for enhanced night vision applications to enable a more reliable obstacle detection and classification.

❖ Low-cost multi-functional and multi-spectral **CMOS vision sensor** (MFOS), detecting critical environmental parameters (fog, rain, …) and providing, at the same time, information on the driving scenario (oncoming vehicles, VRUs in night conditions, …).

❖ High spatial resolution and low-cost **3D range camera** (3DCAM), by the integration of 3D packaging, optical CMOS and laser radar technologies for short range ADAS requirements (high-speed object recognition and distance measurement, e.g. for Pre-crash).

❖ **Harmonic radar** combined to **passive nonlinear reflector** and **active tags** (HR-PTAG and HR-ATAG), enabling easy detection of traffic obstacles and vulnerable road users, and their identification, even in dark or adverse weather conditions.

❖ High temporal resolution and low-cost bio-inspired **silicon retina stereo** bio-inspired **silicon retina stereo sensor**, addressing time critical decision applications (SRS).

ADOSE will have impact on the "virtual safety belt" around the vehicle by offering different sensing technologies for a set of complementary safety functions.

Only 'technology-dependent' pre-processing algorithms will be developed for each sensor: (a) algorithms implemented into the sensor hardware; (b) algorithms on raw data, coming from the sensor hardware, implemented on a PC-based processing hardware, strictly related to the sensing technology and its demonstration. Algorithm developments will not be extended to Sensor Data Fusion.

The algorithms will be compliant to PReVENT-PROFUSION guidelines and ready to be integrated in the standard software architecture for driver assistant systems.

Demonstration will be limited to functional sensor prototypes installed on concept cars without integrating the complete safety system.

Major achievements

Five sensor module prototypes will be designed, fabricated and tested:

- FIR camera (FIR)
- Multifunctional CMOS vision sensor (MFOS)
- 3D range camera and eye-safety illuminator (3DCAM)
- Harmonic radar with passive and active tags (HR P-TAG, HR A-TAG)
- Silicon retina stereo sensor (SRS)

Technology-dependent pre-processing algorithms will be developed for each sensory system.

Two demonstrator vehicles will be set-up integrating two groups of sensors: (a) MFOS sensor, FIR and 3DCAM cameras; (b) SRS sensor and harmonic radar.

For further information:

Information Desk
European Commission - Information Society and Media DG
Office: BU31 01/18 B-1049 Brussels
Email: infso-desk@ec.europa.eu
Tel: +32 2 299 93 99
Fax: +32 2 299 94 99
http://europa.eu/information_society

Fact sheet ADOSE
June 2008