



# A 3 month trip, from Italy to China, without a driver! (No driver cars with Open Intelligent Systems)

(OFAV – A project supported by the European Research Council)

*The OFAV project aims at exploring the use of "intelligent cars" which move without a driver and with a sophisticated system of sensors. The first intercontinental experience of these autonomous cars is taking place this year by means of a trip of 13 000 km from Italy to Shanghai (arrival on 10-10-2010) through different environments, including extreme ones. This experiment will show that it is possible, although in a prototype version, to move goods between two continents with non-polluting vehicles powered by green energy and with virtually no human intervention. The aim is to demonstrate, through an extensive and impressive test, that the current technology is mature enough for the deployment of non-polluting and no-oil based autonomous vehicles in real conditions.*

*Prof. Alberto Broggi, the Principal Investigator of this project, is a pioneer of machine vision applied to driverless cars and unmanned vehicles in general. He received a € 1.75 million grant from the European Research Council, a component of the EU's Seventh Research Framework Programme which aims to stimulate scientific excellence in Europe by supporting the very best, creative researchers of any nationality working, or moving to work, in Europe.*



## Background

Driverless cars are the cars of tomorrow, but this research is a long- term and a risky one. Industry is cautious when deciding on investing in this type of project.. In parallel, improving road safety is an on-going challenge everywhere in the world while offering less polluting vehicles to consumers is responding to a societal demand. The OFAV project, which started on 01/12/2008, is addressing these three challenges. The aim is to demonstrate that the current technology is mature enough for the deployment of these vehicles of the future.

## Objectives

The project's objective is the development of an open architecture for future autonomous vehicles to become a standard platform shared by car makers in the design of next generation intelligent vehicles. It is based on a 360 degrees sensorial suite which includes perceptual and decision making modules, with the ultimate goal of providing the vehicle with autonomous driving capabilities and/or supervise the driver's behaviour. The perception module also includes vehicle-to-vehicle and vehicle-to-infrastructure subsystems, to increment the vehicle's sensing capabilities.

The research is based on the extended know-how and experience of VisLab at the University of Parma, which already marked fundamental milestones worldwide in the field of vehicular robotics. Car manufacturers and automotive suppliers are extremely interested in this research stream, but at the same time are very cautious in investing in long term and risky research like this.



## Expected results

During the definition of the architecture, real tests are mandatory on real vehicle prototypes: vehicles must be able to perceive the environment, take decisions, and move accordingly, all without any human intervention.

In order to test the different modules and to collect a unique set of data in extremely different environmental conditions, VisLab decided to organize an extensive test: a trip from Parma to the 2010 World Expo in Shanghai, China, to be covered by autonomous vehicles.

OFAV will:

- Provide data throughout the trip (7 cameras, 6 laser-scanners, GPS, ) creating a unique database
- Validate the systems that are developed with respect to both software (OLAF will have to face very different situations and road scenarios) and hardware (the systems will be continuously stressed for 3 months in extreme road and environmental conditions)."
- Provide data on road safety
- Have a strategic impact from an industrial point of view: the vehicles , conveniently chosen of reduced size and electrical, will be ready to be used to automate goods handling
- Provide the Municipality of Rome, Italy, with a useful experiment as Rome is planning to exploit these vehicles downtown to deliver goods to shops, collect trash, and arrange sustainable mobility in the last mile.
- The energetic supply from renewable sources will make this kind of mobility sustainable and environment friendly. In particular, the automatic driving system will be energy-autonomous, being powered by a solar panel installed on the vehicle roof.
- Generate scientific publications in international peer-reviewed journals

## Impact

This research aimed at providing vehicles with perception capabilities in order to reduce the number of road accidents and –as an ultimate goal- even for completely autonomous driving.

Besides providing clear advantages on safety for road users, the availability of an open architecture will encourage and make possible the sharing of knowledge between public and private research communities (academic and automotive industry) and thus speed up the design of a standard platform for future autonomous vehicles. Moreover these technologies tested from Italy to China may be transferred to other vehicles and applied to other fields as agriculture, earth moving, constructions, in extreme environments, where the employment of a vehicle able to move without any driver will bring remarkable economical as well as social advantages.

**For more information on the project OFAV, please visit the website:**

[http://vislab.it/Projects/view/35/OFAV:\\_ERC\\_Advanced\\_Grant](http://vislab.it/Projects/view/35/OFAV:_ERC_Advanced_Grant)

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## On the European Research Council (ERC)

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