

Innovative solutions for autonomous navigation of vehicles and multi-modal mobility

What need was solved?

New services for advanced mobility by providing technology in autonomous navigation systems for ground and aerial vehicles, including seamless mobility.

What services were provided?

Autonomous navigation of vehicles and multi-modal mobility is a field in continuous growth due to the advances in areas such as SLAM, sensors for GPS-denied environments, shared human-machine methods, decision-making architectures, and so on. All these technologies allow increasing the autonomy of vehicles and the seamless analysis of mobility across others modes of transport. Researchers from UPM have developed many R&D projects that have contributed in this field. Some examples of these advances are:

PRYSTINE, an industry-oriented European project in the context of autonomous driving, where UPM is developing a fail-operational decision-making architecture that is able to automatically identify and enable the required automation level and human intervention.

For more than a decade, UPM researchers have worked on navigation techniques for social robots operating in populated environments such as museums and trade fairs. National, European and company financed projects have focused on these topics. The latest is Cogdrive, which will incorporate innovative cognitive capabilities for enhanced robustness in navigation and interaction.

UPM expertise through different projects and research networks for personal localization in GPS-denied environments makes the analysis of human mobility possible since individuals or groups can be provided seamless tracking and guidance in transfers/connections between different transportation modes.

U.A.V. autonomous complex missions in environments where GPS is not available (e.g. indoor) or where GPS does not provide enough accuracy (e.g. industrial inspection and/or maneuvers close to obstacles). The acquired images/videos are autonomously processed for scene recognition and detection using Machine Learning techniques. An example of these kind of projects for technology transfer to the industry is the inspection of the boiler of a thermal power plant, developed for GASNATURAL [watch video](#), and the airplane inspection in and out of the hangar contracted by Airbus [watch video](#).

The relation with digitization

UPM developments in autonomous vehicles are in line with interconnected systems and the development of new digital services for mobility.

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