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PROJECTE DE DOCTORAT INDUSTRIAL EXPEDIENT 2016 DI 018

DADES DE L'EMPRESA I DE L'ENTORN ACADÈMIC

Títol del projecte

Geometric Computer Vision meets Deep Learning for Autonomous Driving Applications

Empresa

FICOSA ADAS, S.L.U.

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BREU DESCRIPCIÓ DEL PROJECTE DE RECERCA

Autonomous driving is currently at the forefront of many topics in robotics research and one of the industrial flagships in the automotive industry. Among the different sensors involved in the perception of the environment, color cameras play one of the most important roles, due to their affordability and potential to provide rich interpretations of the scene.

In this thesis we will investigate future trends in the use of cameras in autonomous vehicles. We will consider several RGB cameras deployed all around the structure of the car, primarily on the back and on the wind mirrors. Our goal will be to integrate and process all data of the cameras and provide real-time driver's assistance and information about the surrounding area, including wide-angle view of the rear of the car, and alerts and identifications of the potential dangers.

In order to make this possible we will combine the best of computer vision and machine learning research. In particular we plan to integrate well established practices in geometric computer vision (multiple-view geometry, structure from motion and optical flow), with the powerful deep neural networks. We foresee that the combination of these tools will provide both accurate geometric reconstructions and rich semantic interpretations of the environment.

The project will be carried in cooperation with the following two institutions:

- Institut de Robòtica i Informàtica Industrial (IRI) in the Universitat Politècnica de Catalunya.
- Ficosa

The scientific advisors in IRI will be Dr. Francesc Moreno Noguera and Dr. Antonio Agudo.
The responsible for part of the company will be Jose María Alvarez.



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