Computer Vision for Autonomous Driving

Aim & Purpose:
Nowadays autonomous driving has become a very popular topic, attracting extensive attention from both academia and industry. Computer vision technics have been widely employed in the field of autonomous driving, as visual data provide rich information about the surrounding environment and they are also of low cost to obtain. However, it is rather challenging to achieve comprehensive and accurate understating of the visual data. The challenges mainly come from two aspects. On one hand, the on-road environment is very complex, consisting of a large number of objects from different categories with varying illumination, postures, weather conditions etc. Thus, it is difficult to localize and recognize each object instance precisely. On the other hand, although it is cheap to collect a large amount of visual data, i.e. video sequences, it is usually too expensive to process them; therefore, it is of great importance to accelerate the existing approaches and ensure real-time processing. Although extensive computer vision technics have been developed for generic image processing and image understanding, they are usually not able to meet the requirements in the scenario of autonomous driving. More specific technics that are tailored for autonomous driving are expected to achieve higher performance.

This special session targets researchers from different fields in computer vision, including object detection, image segmentation, and 3D reconstruction etc. It encourages novel computer vision technics for autonomous driving, and will also assemble recent advances in the fields of computer vision and pattern recognition, etc.

We invite original and high-quality submissions addressing all aspects of related fields. Relevant topics include, but are not limited to:

- 2D/3D Object detection in urban traffic scenes
- Video object detection in urban traffic scenes
- Semantic segmentation in outdoor scenes
- Multiple people tracking
- Road segmentation
- Pedestrian pose estimation
- Image enhancement at bad weather conditions
- Depth estimation from monocular images in outdoor scenes
- Reconstruction from multi-view cameras
- 3D scene understanding
- Vision-based Simultaneous Localization and Mapping (SLAM)
- On-board calibration of multi-camera acquisition systems
- Synthetic data for driving scenes
- Lifelong deep learning for driving
- Semi-supervised and self-supervised learning for driving

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