iGP: Autonomous Car

iGP Module: A Real Time Car Detection for ADAS

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Advanced driver assistance systems (ADAS) are systems developed to improve traffic safety by assisting car drivers and to reduce the number of road accidents. ADAS relies on the available sensors (e.g. GPS and Cameras) to improve driving comfort and safety by automatically recognizing and reacting to potentially dangerous traffic situations. Also, driver behavior can be monitored to detect drowsiness and hence decrease the risk of distracted driver.

In this project, an accurate and fast car detection algorithm that fits the driving conditions of the highway, will be developed. Cars will be detected from the back or side view from a distance of 100 meters or even more. That requires a camera system with high resolution than usual. The convolutional neural network system will be adopted to detect cars at different scales. A sliding window of different sizes scans the entire image to choose different candidates. An offline training will be made to cover a big range of input image variations. The convolutional neural networks have shown very good results recently in image detection. The scanning operation results in a set of layers used to build a feature vector for each bounding box. DSP KIT implementation will be considered to overcome the real time issue.