Body:

Motivation

Real-time, reliable and stable autonomous driving is obviously a dream the car industry is approaching rapidly fast. Using modern technologies based on multi-modal sensor information, graphics processing and deep learning based on big data makes the goal more and more realistic. In this project, we aim for a low-cost solution for a smart environment camera with onboard processing for landmark detection, tracking, localization and object recognition and smart decision-making. With such a system, it will be possible to let people and robots work together in one environment and to develop systems suited for outdoor navigation, even under rough conditions, such as rain, snow, fog or darkness.

Challenges & Highlights

The challenges are multifold: On the one hand, only resource-limited operations are possible, and energy-demanding algorithms (e.g. deep neural networks) are only allowed to be used very seldom. On the other hand, many image processing steps need to be computed in parallel, and memory access should be treated very efficiently. Thus, it requires a special need for low-cost features which can be fed into sparse neural networks. Features should be learned and partially designed with desired rotation variance and illumination invariance properties. Additionally, the system should easily adapt to novel settings and learn very fast from new situations.

Potential applications & future issues

Autonomous driving has many applications for industry. In this project, we will not focus on autonomous cars transporting people but on small low-cost platforms which are applied, for instance, in high rack storage areas.

Logo:

Project abstract:

The BLINKER project is a collaboration between L3S and Goetting KG, a company which is specialized on driverless transportation systems. The goal is to develop a 360-degree camera that constantly monitors the environment while driving. The camera will be used for navigation using artificial and natural landmarks and also for people detection, obstacle avoidance and situation awareness.

Project duration:

31.12.2018

Bibsonomy show project publications:

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Members:

rosenhahn

Project manager: