

## EINLADUNG

Zeit: Freitag, 06.11., 14.00 Uhr

Ort: UMIC 025, Mies-van-der-Rohe Strasse 15

Referent: Herr Dr. Uwe Franke  
Daimler AG, Böblingen

Titel: Progress in Real-Time Stereo Vision

### Abstract:

The performance of future driver assistance systems - as well as the potential of autonomous robots - depends on precision, robustness and completeness of their environment perception. The urban scenario in particular poses high demands on the computer vision, since dangerous situations have to be recognized fast and with high confidence. The talk will present a dense stereo analysis scheme with real-time capability. Recently developed methods to reach maximum precision in sub-pixel accuracy will be described. Most known stereo systems concentrate on single image pairs. It will be shown that a smart fusion of stereo vision and motion analysis (optical flow) gives much better results than classical frame-by-frame reconstructions. The basic idea is to track points with depth known from stereo vision over two and more consecutive frames and to fuse the spatial and temporal information using Kalman filters. The result is an improved accuracy of the 3D-position and an estimation of the 3D-motion of the considered point at the same time. This approach, called 6D Vision, enables the detection of moving objects even if they are partially hidden. From static points very accurate occupancy grids are built. A global optimization technique delivers a robust estimation of the free space which is important for the situation analysis. The moving pixels are clustered to objects which are then tracked over time in order to estimate their motion state and to predict their paths. This allows for powerful collision avoidance systems: pedestrians crossing the street are detected before they enter the lane; the same holds for vehicles from the side, which are not detected by common radar systems. The presentation will be held in German.

Es laden ein: Die Dozenten der Informatik