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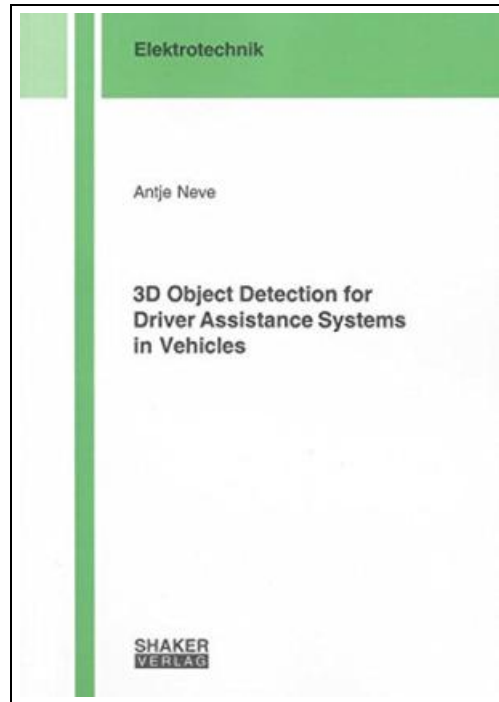
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Shaker Verlag Aug 2009, 2009. Taschenbuch. Condition: Neu. Neuware - Humans can perceive their environment in 3D. This allows them to estimate distances, to safely interact with their environment and to drive vehicles, for instance. Systems that facilitate a more comfortable and safer way of driving have increased their market share and are becoming more and more important. For instance, pedestrian detection based on infrared night vision systems as well as adaptive cruise control systems help to avoid accidents and/or mitigate their consequences. This thesis addresses object detection with a 3D camera and active illumination. This sensor not only generates an intensity value but also a distance measurement for each pixel based on the time-of-flight principle. The camera is integrated and tested in a vehicle. For the 3D images a signal processing chain consisting of filtering, amplitude and distance based segmentation and classification is developed. For the applications pedestrian detection and adaptive cruise control stop & go, a combination of rule based and machine learning algorithms are used to detect object classes such as pedestrians, vehicles, trucks and traffic signs. Furthermore, the potential for an automated garage parking application based on a 3D camera sensor is tested and evaluated. By means of hit rates and false positive rates, and using a DGPS sensing system, the performance and accuracy of the developed software is evaluated. Driver assistance systems need to function reliably in adverse weather conditions. This work includes an in-depth theoretical analysis combined with profound practical experiments to analyze the performance of the 3D camera in adverse weather conditions such as snow, rain or fog. 196 pp. Englisch.

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