

FREIE UNIVERSITÄT BERLIN Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

DISPUTATION

Freitag, 26. September 2014, 12.15 Uhr

Ort: SR 006, Takustr. 9, 14195 Berlin

Disputation über die Doktorarbeit von

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**Thema der Dissertation und der Disputation:
Robust Computer Vision for domestic robot applications**

Die Arbeit wurde unter der Betreuung von **Prof. Dr. R. Rojas** durchgeführt.

Abstract: In this talk we show novel techniques for the robust estimation and segmentation of indoor room structure using common 2.5d sensors, namely AIT Stereo Vision and Microsoft's Kinect. The underlying concept of this work is the so-called Manhattan world assumption i.e. the frequently observed dominance of three mutually orthogonal vanishing directions in man-made environments. Many indoor environments can be considered Manhattan-like if the furniture is aligned to the walls and the room is rectangular within limits. Our methods works in three steps: First we estimate the Manhattan world, extract features and fuse them together in a segmentation. The estimation uses three different techniques i.e. 2D vision using vanishing point detection, 3D vision using minimum entropy in histograms and normal vector MSAC estimation. All methods work efficiently and independently from each other and are robust to noise and occlusion.

We show that our method is robust and accurate in realistic environments using our own created database. This work can be applied for indoor robot navigation, object recognition and holistic scene understanding. Our approach is not limited to AIT Stereo Vision and Microsoft's Kinect and can be used with any 2.5d sensor like for example in Google's Project Tango.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Prof. Dr. R. Rojas