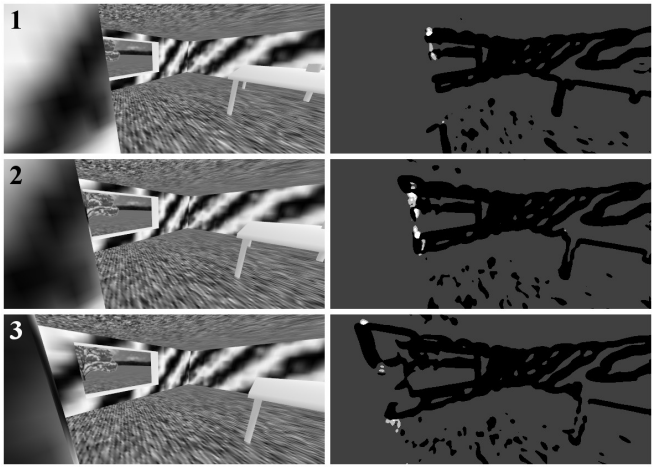
STUDENT PROJECT offered at the Institute for Neurobiology

EBERHARD KARLS UNIVERSITÄT TÜBINGEN

Bachelor thesis in computer vision

Assessment of dis-occlusion rate in motion sequences

Background. Dynamic occlusion and dis-occlusion – the accretion and deletion of features behind an occluding edge – is produced either by motion parallax or independent object motion. In human vision dis-occlusion is well known as strong cue to image segmentation (e.g., Yoonessi & Baker 2014). The LAPTEV (2005) spatiotemporal filter – a generalization of the HARRIS (1988) corner and edge detector into the temporal domain – is a tool for analyzing such cues in motion sequences. Prior tests in virtual environments indicate that the dis-occlusion rate can be suitable for the segmentation of space into distinguished regions by detecting narrow passages.



Project. Virtual environments provide a good basis to study the effect of motion parallax in isolation. Abrupt camera movements originating from vibrations, friction or insufficient motor control are avoided. Such movements might also result in large LAPTEV filter output without actually corresponding to dis-occlusion. In order to consolidate our findings, camera recorded motion sequences will be evaluated.

Methods. MATLAB programming, image processing. Optional: C++ programming, OpenCV.

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References.

Harris, C., Stephens, M. (1988). A combined corner and edge detector, *Alvey Vision Conference*: 147-152

Laptev, I. (2005). On Space-Time Interest Points, *International Journal of Computer Vision* 64(2/3): 107-123

Yoonessi, A., Baker, CL, Jr. (2014). Boundary segmentation from dynamic occlusion-based motion parallax. *Journal of Vision* 14(4):15, 115