

Master's Thesis

# Event Cameras for Industrial Applications

Compared with traditional frame-based cameras, an event-based camera has the advantages of low latency, high dynamic range, (almost) no motion blur, etc., and can respond fast to a brightness change at the image plane with thresholds determined by the previous state of brightness. It can generate event data of structural features without signal processing, such as edges and corners, which saves time, energy and computing effort.

However, it still lacks standard processes for analyzing, characterizing and evaluating event-based camera information. Moreover, data acquisition of this camera demands changes in brightness on a respective pixel. This can be introduced artificially by relative movement of the camera to the object. This might miss out part of the data due to linear translation along structural elements like edges or introduce some error due to error motion or vibration.

This thesis aims to ensure safety and quality when implementing event-based cameras in the field of industrial inspection, by dedicated experiments and related discussion of results. Event based camera images will be characterized and evaluated. New methods for event generation and signal processing will be proposed which will make use of the special characteristics of event-based cameras and their special characteristics arising from their working principle.

## Advisors

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