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AREA OF EXPERTISE:	Biologically Inspired Sensors
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The progress reported in this thesis shows that biological systems can be used as an inspiration to build better devices. Event-driven sensors are great example how nature can be used as an inspiration and be utilized by electronic circuits to overcome limitations of conventional vision sensors.

Bio-inspired sensors are a result of the Neuromorphic engineering development. Neuromorphic engineering uses electronic circuits to mimic neuro-biological principles of operation present in living organisms. Mimicking nature is motivated by the fact that biological systems easily outperform conventional artificial ones in terms of processing and power efficiency. For vision sensors, a specialized light-sensitive tissue located under eye, called retina, serves as an inspiration. The retina is greatly optimized to perform complex parallel pre-processing of the visual scene and to efficiently extract relevant information from it.

In this thesis, two topics in the area of bio-inspired sensors were studied. First, implementation of a spiking vision sensor detecting transients between three primary colors was explored. The second part of the PhD research focused on practical usage of spiking sensors to build a high-performance and low power sun sensor for the space application.

The findings suggest that spiking sensors should not be considered as a direct competition for frame-based vision sensors. Due to their entirely different principle of operation, these sensors can complement each other, such that great quality and high-resolution images from frame-based sensors can be supported by computationally efficient and low latency spiking sensors able to extract some features from the same scene.