TECHNISCHE UNIVERSITÄT MÜNCHEN

NEUROWISSENSCHAFTLICHE SYSTEMTHEORIE

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S C I E N T I F I C   S E M I N A R

Event-based stereo algorithms

Problem description:

In our lab, we use so called dynamic vision sensors[1]. The working principle of these recently invented sensors is very different from the one of conventional cameras and mimics the functionality of biological eyes. Every pixel works independently and sends a so called event as soon as it senses a change in brightness. The entirety of pixels generate a continuous event stream. This is fundamentally different from classical camera systems. In contrast to regular cameras, there is no notion of single pictures or frames in DVS streams. Computer vision algorithms designed for classical systems can therefore not be simply transferred to the event-based domain. However, the problems these algorithms address still need to be solved for event-based vision systems. This seminar work deals with one of these problems, namely stereopsis; we want you to explore the field of event-based stereo vision. Review the literature and find different approaches on tackling the stereo problem with event-based vision systems. Describe the algorithms and compare them with respect to relevant aspects like speed, quality of results etc.

- Get familiar with the DVS vision system and the stereo problem
- Describe different algorithms for solving the stereo problem in the event-based domain
- Give an overview over worldwide research groups and the algorithms they have been working on
- Compare the algorithms stating advantages and disadvantages

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Bibliography:

[1] Lichtsteiner, P., Posch, C. and Delbruck, T. *A 128 times; 128 120 dB 15 us Latency Asynchronous Temporal Contrast Vision Sensor* IEEE Journal of Solid-State Circuits Feb. 2008 p. 566-576