

Lab Rotation - Image reconstruction in event sensors

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1 Introduction

Retinomorphic event cameras are biologically inspired cameras that unlike traditional cameras do not capture entire intensity of the visual space at a given time. Instead, these sensors capture any change in intensity of pixels in the visual space (beyond a certain threshold) without being bounded by time [2]. This asynchronous nature and sensitivity to scene dynamics have led to a lot of advantages namely low latency, high temporal resolution, high dynamic range and low power consumption compared to conventional frame based camera. My lab rotation deals with implementing an image reconstruction algorithm and comparing it with a CNN algorithm ; further I intend to try a different dictionary learning algorithm to represent the events. The deliverable of the lab rotation is enumerated below :-

- History of Image reconstruction in Event camera.
- Study and implementation of Image Reconstruction by dictionary learning. [1]
- Study, implementation and analysis of FireNet.[4]
- Comparative analysis of the two algorithms.

References

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- [3] Jicong Fan, Chengrun Yang, and Madeleine Udell. Robust non-linear matrix factorization for dictionary learning, denoising, and clustering. *arXiv preprint arXiv:2005.01317*, 2020.
- [4] Cedric Scheerlinck, Henri Rebecq, Daniel Gehrig, Nick Barnes, Robert Mahony, and Davide Scaramuzza. Fast image reconstruction with an event camera. In *The IEEE Winter Conference on Applications of Computer Vision*, pages 156–163, 2020.