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]. 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 :-

- Study and implementation of Image Reconstruction by dictionary learning. [1]
- Study and analysis of FireNet.[4]
- Determine the metrics for comparison.
- Extend the algorithm by using a different dictionary learning methodology. [3]

References

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[2] Kwabena Boahen. Neuromorphic microchips. *Scientific American*, 292(5):56–63, 2005.

[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.