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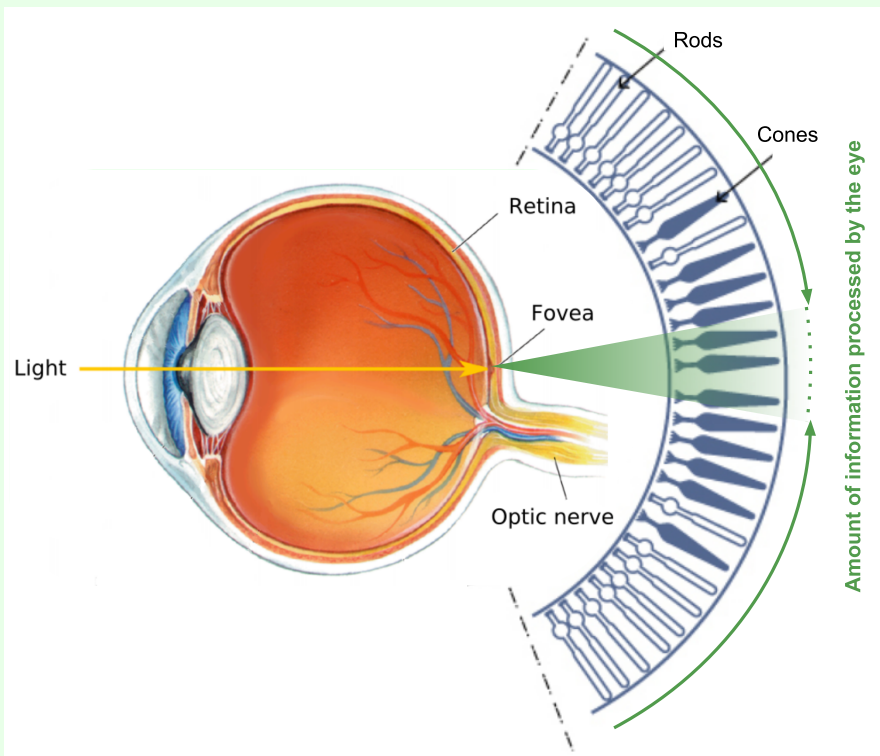
Stakes of foveation on event cameras

Enjeux de la fovéation appliquée aux caméras événementielles

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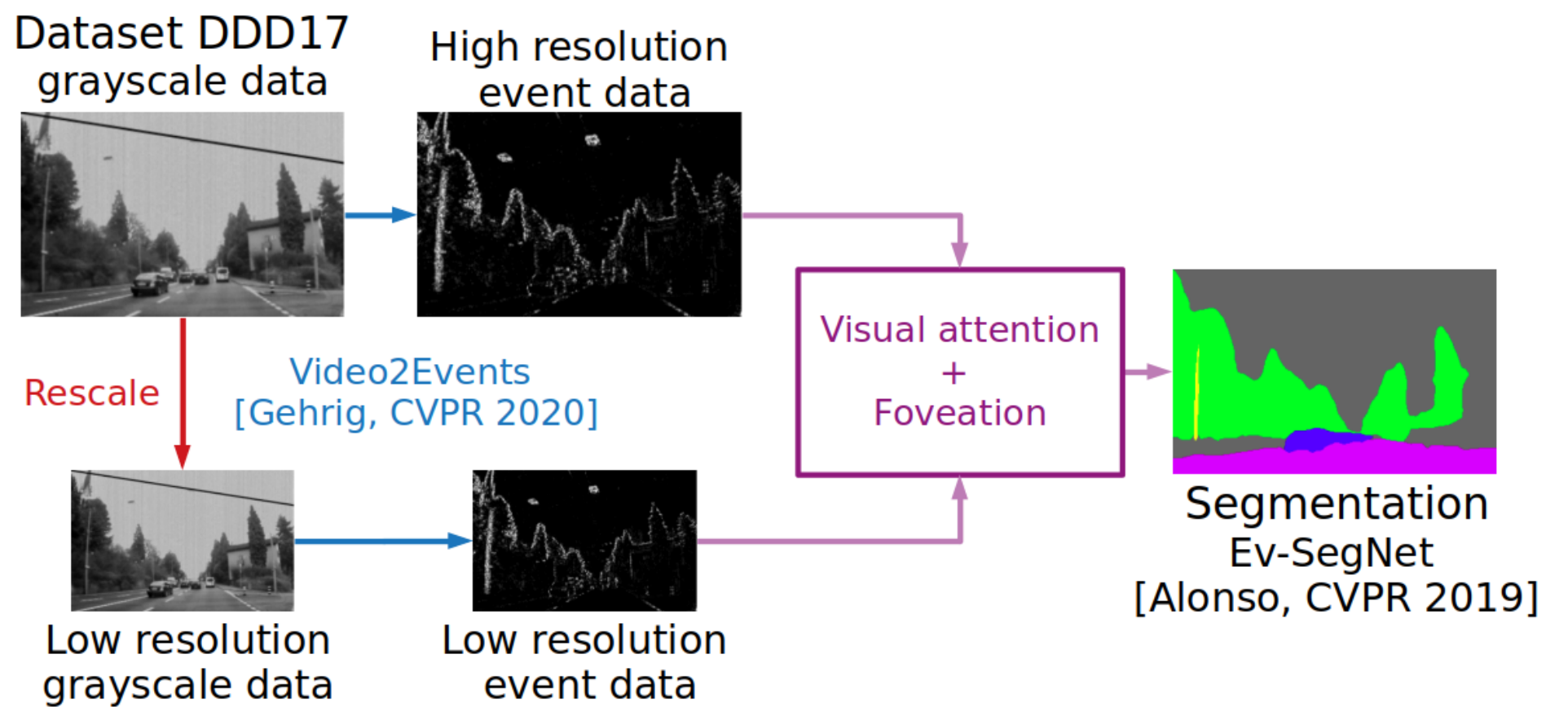
Bernabé Linares-Barranco Teresa Serrano-Gotarredona
 Instituto de Microelectronica de Sevilla IMSE-CNM - Spain

Foveation

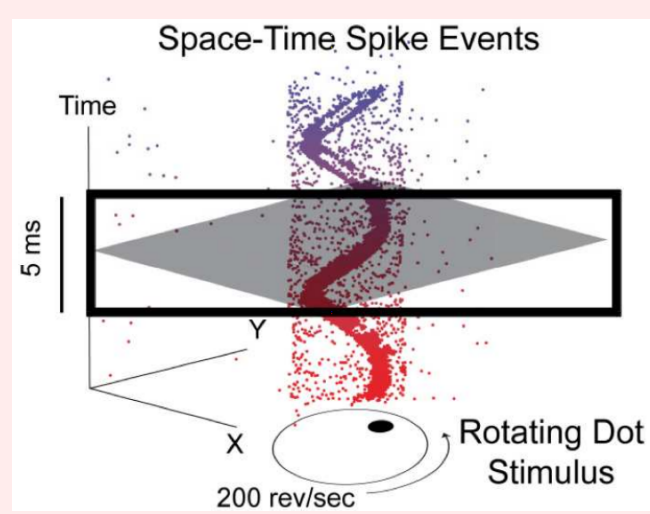


Adapted from [Bear, 2007] & [Tobii Technology, 2020]

Proposed approach



Event camera [Lichtsteiner, 2008]



- Foveation for events :
- Significant energy-efficiency
 - Maintains a high accuracy regarding relevant information
 - Reduce the amount of raw data to handle

References

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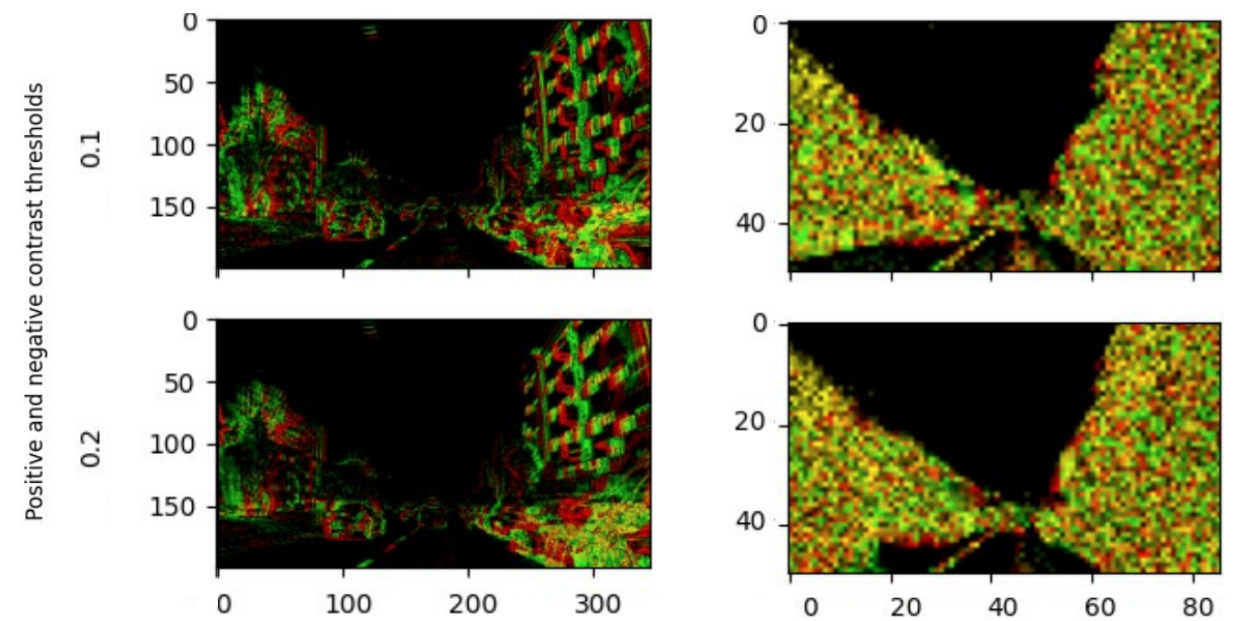
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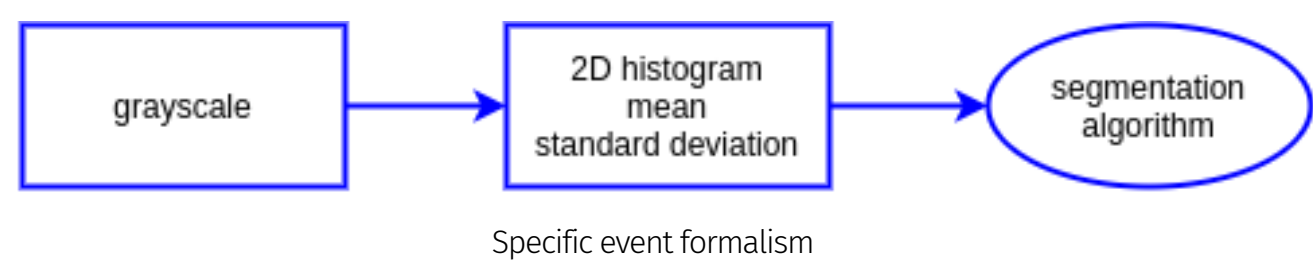
Input data



DAVIS Driving Dataset 2017 [Binas, 2018] (left) translated into high resolution (middle) and low resolution (right) events using Vid2e module [Gehrig, CVPR 2020]

Segmentation algorithm

Ev-SegNet [Alonso, CVPR 2019] : encoder-decoder architecture for semantic segmentation on event images

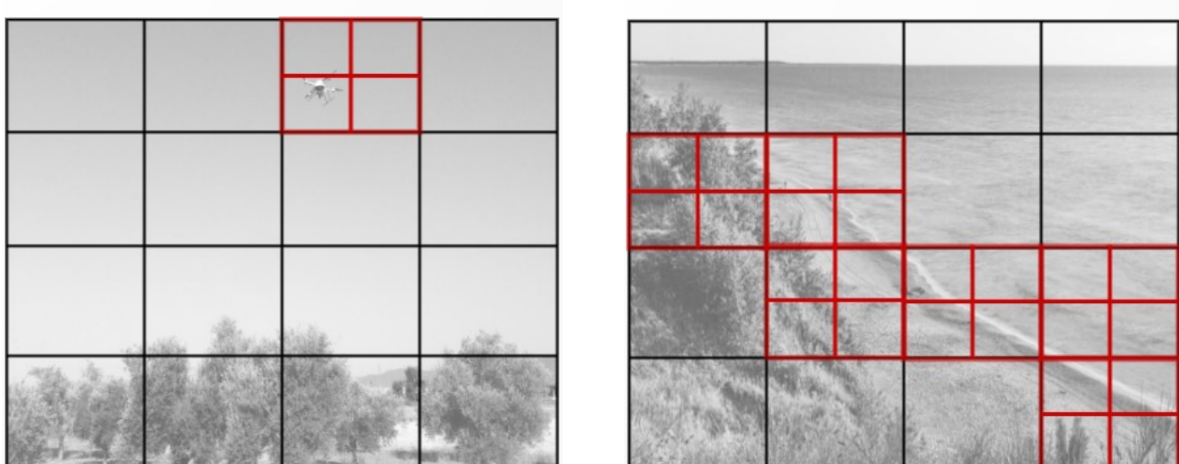


Specific event formalism

Detection of regions of interest

One region of interest (biologically coherent)

Many regions of interest (beyond biology)



Identification of regions of interest (in red) in different grayscale images

Little explored issue regarding event data

Three possible mechanisms, in increasing complexity :

- Event density (using spiking neural networks)
- Saliency (adapt [Itti, 1998]'s attention model in multimedia to events)
- Gestalt laws (detection of proto-objects, see [Iacono, IROS 2019])