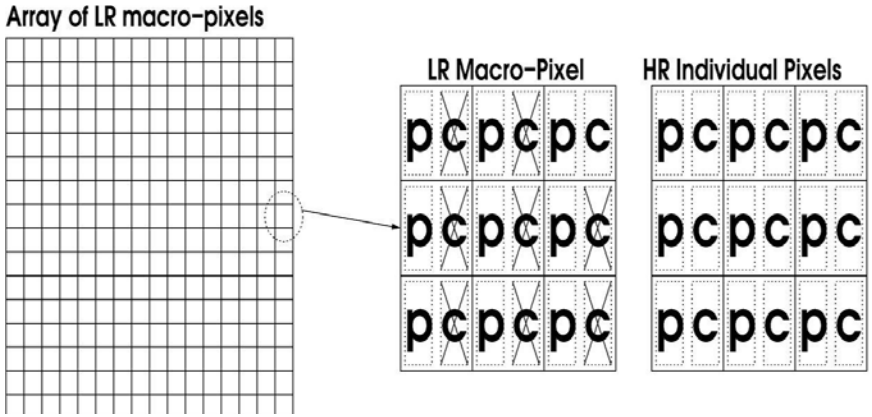
Technology Offer CSIC/ER/003

SENSITIVE DYNAMIC VISION SENSOR (DVS) AND METHOD FOR VISION SENSING



A Sensitive DVS and method wich allows to perform foveation, computing temporal contrast on pixels for low and high resolution simultaneously.

Ideal for applications requiring both high-speed motion detection and power efficiency, such as autonomous vehicles, robotics, and advanced surveillance systems..

Intellectual Property

Priority patent application filed

Stage of development

Laboratory Component Validation and Optimization

Intended Collaboration

Licensing and/or co-development

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Market need

A DVS is a novel type of vision sensor where its pixels work continously transmiting their coordenates when detecting a relative change of light, like a retina not having a fixed frame rate. This way,in a DVS there are no images. Consequently, foveation techniques used in imagers cannot be directly used in DVS cameras.

Foveation is the Techniques by wich part of the visual field is captured at high resolution, while the rest is captured at low resolution. In imagers it is typically done by capturing a high resolution luminance image inside the chip, and groupin pixels. Images do not exist in a DVS. The low resolution outside the fovea region is achieved by forming macropixels, whose luminance level is the average of their component pixels. This process significantly reduces the information sent off-chip.

Proposed solution

Our DVS use multiple physical high-resolution pixels that can be grouped into low-resolution macro-pixels, each containing a master pixel. The remaining pixels are designed to share its voltage with the master pixel, which triggers an event when the combined voltage surpasses a predefined temporal contrast threshold.

The new DVS comprises a controller that allows to dynamically adjust fovea regions with High-Resolution (HR), and Low-Resolution (LR) background regions. In LR regions only the master pixel can trigger events upon reaching the LR temporal contrast threshold. In HR regions all pixels can launch events once they surpass the HR temporal contrast threshold. The method for vision allows to quickly move the fóvea region or multiple foveas.

Competitive advantages

- **Simultaneous Multi-Resolution Processing:** Compute temporal contrast of complete low-resolution scene simultaneously to that of the high-resolution detail in fovea regions.
- **Dynamic Foveation:** Continuous movement capability of fovea regions for optimized focus on areas of interest.
- **Rapid Response Time:** Sub-microsecond output addressing for fast and accurate event detection.