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PROJECT

GRANT AGREEMENT NO.	**270324**
ACRONYM	**SEEBETTER**
TITLE	**SEEING BETTER WITH HYBRID BACKSIDE ILLUMINATED SPATIO-TEMPORAL SILICON RETINA**
CALL	**FP7-ICT-2009-6**
FUNDING SCHEME	**STREP**

DELIVERABLE D6.1
PUBLIC SUMMARY OF THE PROJECT

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1. PUBLIC SUMMARY

The public summary of the project was taken from the first section of the DoW and put in the homepage of the website. The text can be found below:

> Conventional image sensors are fundamentally limited by comparison with biological retinas, because they produce redundant sequences of images at a limited frame rate. By contrast neuromorphic 'silicon retina' vision sensors mimic the biological retina's information processing capability by computing the salient spatial and temporal aspects of the visual input, and encoding this information in a frame-free data-driven asynchronous spiking output. The range of application of these silicon retinas remain restricted because of their low quantum efficiency and their inability to combine high quality spatial and temporal processing on the same chip. Solutions to these technical challenges would revolutionize artificial vision by providing fast, low power sensors with biology's superior local gain control and spatiotemporal processing. Such sensors would find immediate and wide application in industry, and provide natural vision prostheses for the blind.
>
> It is the goal of SeeBetter to address these limitations, by realizing an advanced silicon retina with the superior quantum efficiency and spatiotemporal processing of biological retinas. We will address these problems through a multidisciplinary collaboration of experts in biology, biophysics, biomedical, electrical and semiconductor engineering. Our objectives to achieve our goal are:

1. to use genetic and physiological techniques to understand better the functional roles of the 6 major classes of retinal ganglion cells,
2. to model mathematically and computationally retinal vision processing from the viewpoint of biology, machine vision, and future retinal prosthetics,
3. to design and build the first high performance silicon retina with a heterogeneous array of pixels specialized for both spatial and temporal visual processing, and
4. to combine this silicon retina with an optimized photodetector wafer with high quantum efficiency using state of the art back side illumination and hybridization technologies.