



The Digital Retina

The Concept of The ai-one™ Retina

The engineers of semantic system ag have laid the foundation for building biologically inspired computing by developing a neural data handling environment which can be implemented in standard computers as a SDK. The solution can be run as software or can be implemented on a FPGA chip technology. (programmable chips)

This first generation of biologically inspired computing is enabled to "think" like a biologic brain. For the first time in computing it is possible to run complex thought and analyzing processes in a computer chip or as a software-program and thereby to get results equivalent to those obtained manually by a human.

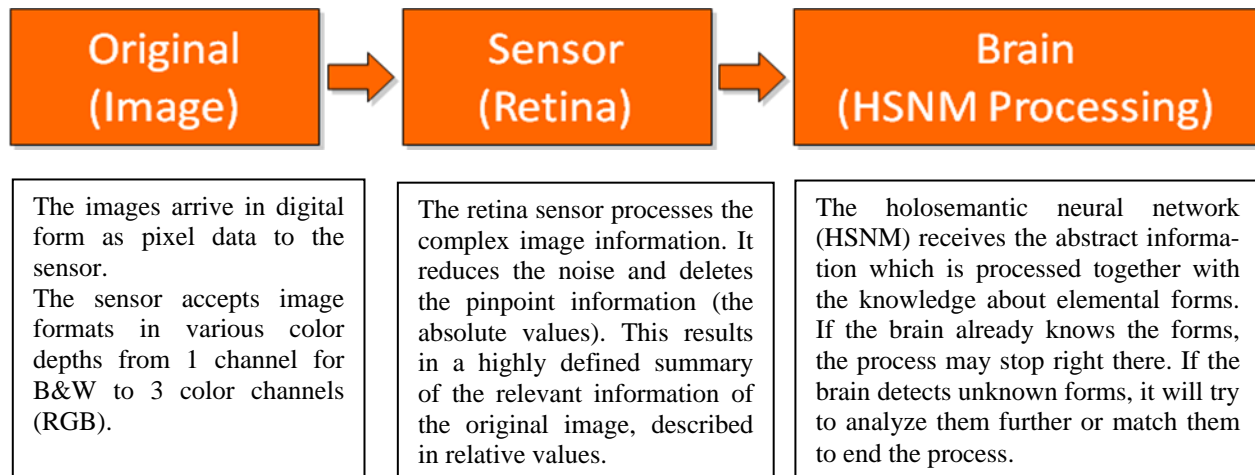
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For example it is possible to describe an image (pixel file) entirely in abstract forms such as circles (including arcs, segments etc) and straight lines. The smallest data quant in our retina is a pixel. The abstractor has the ability to recognize circles and lines and thus can break down each image (pixel file) in an abstraction – which is its intelligence. This takes place as a neuronal process in the holosemantic net on the retina. The abstractor recognizes any shapes and the existing dependencies among each other (concepts). The shapes can be sharp or blurry; the image can be bigger or smaller as the retina. The retina can zoom and analyze in an accurate or fuzzy way (Re100 = 100 x 100 Pixel).

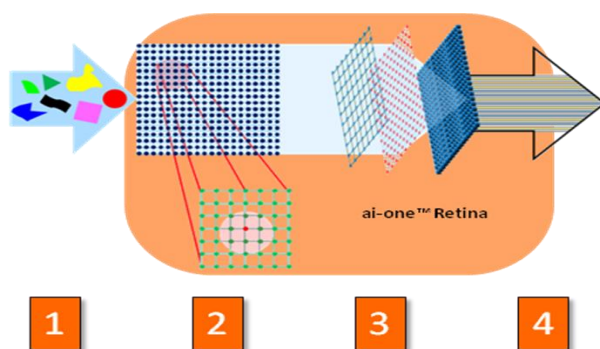
The result is the ability to compare and match images like human experts. There are hundreds of applications where images have to be compared, classified, sorted, etc. Almost all industries require this functionality. But hitherto this functionality has been implemented rather poorly by using text tags to describe images.

The Schematic Functionality of The Digital Retina

One of the first solutions for recognizing images will be marketed in Q2 2008. The digital retina, based on the new ai-one™ concept recognizes image information like the human eye. It can abstract information structures, discern important information from noise and pinpoint information in an image.



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The digital ai-one™ retina is structured into the receiver layer and 3 pre-processing layers. [1] The image hits the 10'000 receiver cells. [2] These receiver cells analyze the surrounding area (~48 pixel) of each image pixel. The goal is to define, whether there is information about a structure or a form within the pixels in this area or if it is just noise. [3] In order to define important structures the retina processes each image pixel (data quant) through 3 aggregation cell layer. [4] The result is a stream of highly defined information strings, about 2 M strings. This is comparable to the information signal in the optical nerve of the human retina.

The ai-one™ holosemantic neural meshwork (HSNM) contains the thought process of the ai-one™ brain. [1] The defined information strings of the ai-one™ retina (~ 2 M) hit the first processing area [2], the star cells. There are about 1.5 M star cells. These cells detect the basic information elements. [3] About 1 M so called pyramide cells detect the basic forms and shapes. [4] The most important process starts here. This is the “Darwin” process. About 440 M inhibitorial synapses start the process of eliminating concurrent shapes, because for every basic shape n-10'000 concurrent shapes are detected. [5] The result is an extended database of shapes and forms, which are exactly like those in the original

