A neuromorphic head embryo ?.

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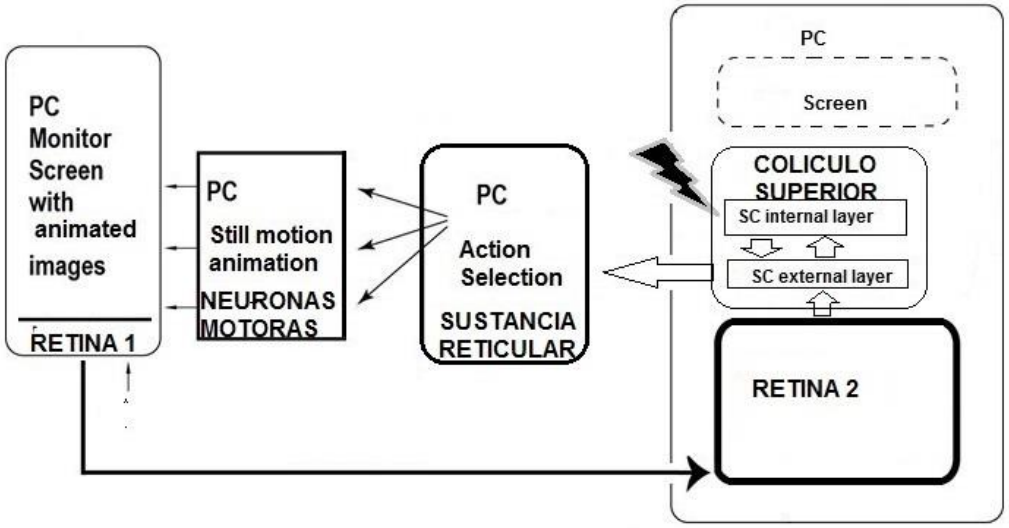

Figure 1 Superior Colliculus neuromorph model (integrative program) of gazing behavior. A lightening black symbol represents the simulation of the SC stimulation.

Figure 1 is an updated version of the one given in [Negrete & Negrete] (Figure 9), with the inclusion of the SC stimulation .

The present neurobotic head was constructed keeping the specifications published in Neuroinformatics 2005 [Seth et al.] :

Q0) It is a physical device.

Q1) Its behavior is controlled by a simulated neuromorphic nervous system having a design that reflects, at some level, the (Q1.1) brain's modular architecture and (Q1.2) dynamics.

Q2) As a result of these properties, neurobotic models and their physical constructions provide heuristics for developing and testing theories of brain function.

Q3) the neurobot engages in a (several) behavioral task.

Q4) the neurobot is situated in a structured environment.

Q5) the neurobot provides theories of brain function in the context of phenotypic and environmental interactions.

Neuromorph-embrio's neck-eye behavior (see Q3)

The gazing activity of the neurobot with an integrative program similar to the Superior Colliculus model can be seen in Figure 2.

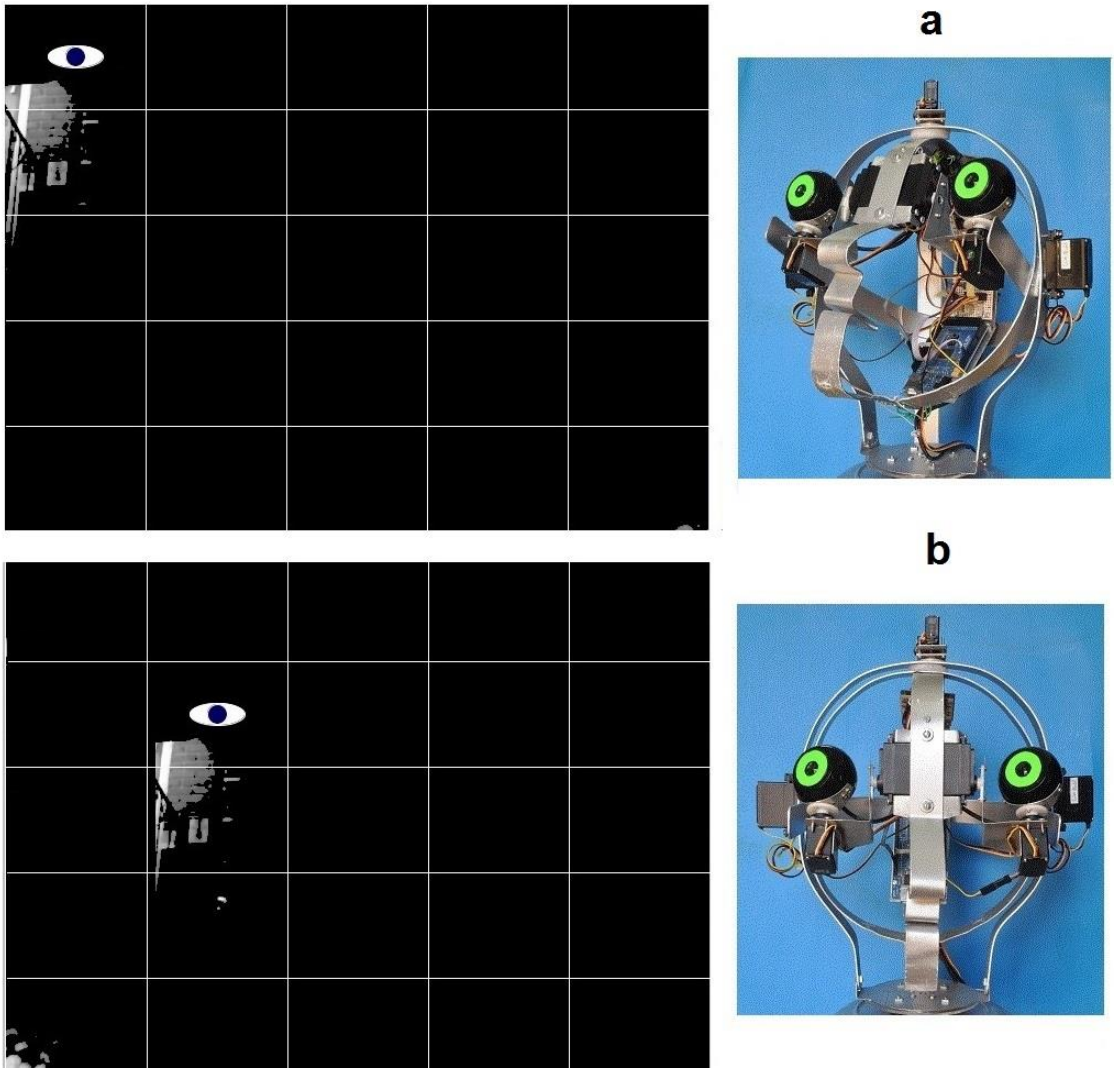

Figure2 . neurobot gazing attitude in two subsecuent moments (a to b) after a visualy salient object is detected in the periphery of the visual field.

in figure2 a the neck movements precede (the eye saccade movemets (figure 2b). this saccades may or may not be produced.

The embryonic hypothesis (see Q5).

Implicit in the title of this article is the hypothesis of the feasibility of the construction of a neuromorphyc embryo. We consider that our implementation is actually a true neuromorphyc embryo because:

1. Its neuromorphyc parts can be mapped into neuromorphic components.in the same way embryo parts are made of embryonic parts.
2. The components are organized in neuromorphyc units. In the same way embryos are organized in systems and organs.
3. the units must be provided by integrative neuromorphs, the same way the central nervous system is organized .
4. The head can be reprogrammed, disassembled and assembled with additions in order to learn more about neurobiology. With the same purpose animal living embryos have been experimentally used.
5. The pending explorations mentioned at the end of the previous section show a sample of the huge maturation panorama that this embryo offers (as any living embryo does) even without disassembling it or adding new parts.

REFERENCES

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