Simulating and Analyzing IF and LIF Neuron Models for Selective Visual Attention

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Abstract

By nature biological systems have the capacity to selectively guide their attention on some portion of visual scene and process only that selected information for further processing. The similar abilities are also required in artificial vision systems so that they can become more efficient and realistic as biological systems and in future manual supervisory and detection work can be replaced by artificial visual systems. In this paper concepts of visual information processing and selective visual attention are implemented and analyzed. The results from two neuron models viz. IF and LIF models are compared and an analysis is made. In visual selective attention model the attention is guided towards only the most salient object while ignoring the less salient objects this way the time taken to process the image is reduced as large amount of information which is not much relevant is rejected for further processing. The study made in this paper will be proving to very effective as it will enhance the reliability of the system. The visual system can be used in robot vision system, can be deployed in choke points of city and major functions to detect accidents etc. This concept is also useful in marketing to make a few second advertisements more effective.
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References


Index Terms

Computer Science  Image Processing
Keywords

IF-integrate and fire model, LIF-leaky integrate and fire model, Selective visual attention, salient objects, robot vision system, supervisory and detection work