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Joint Study of Visual Perception Mechanism and Computer Vision Systems That Use Coarse-To-Fine Approach for Data Processing

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Aspects of visual perception mechanism and pattern recognition methods were examined jointly. It was shown that for various computer vision tasks coarse-to-fine approach is used mainly for decreasing the number of calculation-intensive operations on initial data. Latest results from neurophysiology in studying the visual system of living beings were discussed. The fact of receptive field excitatory zone resizing in neuron of visual system during visual act allowed considering another view on coarse-to-fine approach for computer vision that makes possible to resolve tasks that can not be resolved at all by traditional methods. On the basis of systemological analysis of neurophysiology sources a new hypothesis about visual neuron's functioning was proposed. This hypothesis explains the mechanism and takes into account receptive fields excitatory zones resizing during visual act.