

Edge Detection Using Multi-Agent System: Evaluation on Synthetic and Medical MR Images

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Abstract : Recent developments on multi-agent system have brought a new research field on image processing. Several algorithms are used simultaneously and improved in deferent applications while new methods are investigated. This paper presents a new automatic method for edge detection using several agents and many different actions. The proposed multi-agent system is based on parallel agents that locally perceive their environment, that is to say, pixels and additional environmental information. This environment is built using Vector Field Convolution that attract free agent to the edges. Problems of partial, hidden or edges linking are solved with the cooperation between agents. The presented method was implemented and evaluated using several examples on different synthetic and medical images. The obtained experimental results suggest that this approach confirm the efficiency and accuracy of detected edge.

Keywords : edge detection, medical MRImages, multi-agent systems, vector field convolution

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