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Editorial

Papers in this Issue

It is well known that neural networks are capable of assisting with computer version. Image recognition, however, has problems due to lack of information in the image. In the first paper of this issue, the authors view the problem as constrained optimisation. The paper examines the suitability of four unsupervised techniques for the task of edge linking. Two of the methods tried, showed themselves to be good candidates for the application, whilst two others were found suited to some specific image-processing applications.

Banarse and Duller in the second paper consider a self-organising neural network architecture for grey-scale visual object recognition. The processes involve feature extraction, sub-pattern detection and classification. The network described can successfully partition images based on shape to a fair degree of accuracy. The paper considers the sensitivity of the network to parameters that govern the size of detectable patterns and the areas over which they are tested. The robustness of the network to the order of pattern presentation is also considered.

In the third paper, G. Tambouratzis considers an image segmentation method based on a self-organising logic neural network. The network is shown to have variable sensitivity to the detection of sub-textures within each texture to a desired degree of detail. The proposed approach is considered to be an effective design of a texture-based image segmentation system. Classes generated by the self-organising system reflect the natural structures existing in the pattern space.

The penultimate paper in this issue by Dracopoulos and Jones looks at the problem of adaptive control of chaos applied to the control of attitude (i.e. orientation) of a tumbling object e.g. a satellite which exhibits chaotic motion. The problem is particularly challenging and has important application areas. The control system presented here is adaptive and uses neural networks and genetic algorithms. The system described is successful in being able to attain any specified system state in the presence of noise, with no prior knowledge of the dynamics of the chaotic motion and with large perturbing forces.

Finally, T. Tambouratzis considers graph planarisation. This consists of determining a graph in which the edges between the connected vertices of the original graph have the least number of crossings. A graph with no crossing is planar. The problem is also to find the maximal planar subgraph which is to find the maximum number of edges in the original graph which can be accommodated such that no crossings are necessary. A Harmony Theory artificial neural network is proposed here which solves both the problems and the result is transparent in that activations of the nodes are open to interpretation.

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Retiring Editor