Abstract

This article presents a multi-agent approach for the segmentation of images. A multi-agent system (MAS) is a distributed system consisting of a set of agents that interact with themselves in an environment they are able to perceive and on which they can act. The proposed solution consists in cutting the space of the image to treat it in a set of sub-spaces (partitions of the image) in which several agents are created to detect the outlines of objects then to follow them (these agents are called detector – followers agents). These agents adapt a very efficient algorithm of detection and follow the outline according to the characteristics of the region that they evolve in. The information so collected is transmitted to levels of supervision agents (agents partitions) which take care they with collecting the information emitted by the agents detector - followers, to update tables containing the parameters of segmentation and to elaborate global strategies of management of the agents detector - followers (creation, destruction, setting in a stand-by mode or initialization of agents detector-followers). At the highest level of this agent’s hierarchy, we find the supervisor agent of this whole system. An implementation of this approach by the use of Madkit system allowed us to observe a gain in performances and in precision very important due to parallel, concurrent and cooperating execution of tasks.
An Adaptative Multi-agent System Approach for Image Segmentation

References

- Ferber, J. 1999 Multi-Agent Systems: An Introduction to Distributed Artificial Intelligence Addison-Wesley Longman Publishing Co., Inc., Boston, MA, USA.
- Bellet, F. June 1998 Une approche incrémentale, coopérative et adaptative pour la segmentation des images en niveau de gris. Institut National Polytechnique de Grenoble, France. (In french)
- Boucher, A. Fevrier 1999 Une approche décentralisée et adaptative de la gestion d&apos;informations en vision. Thèse de doctorat de l&apos;université Joseph Fourier Grenoble I. (In french)
An Adaptative Multi-agent System Approach for Image Segmentation


Index Terms

Computer Science Image Processing

Keywords
Agent multi-agent system (MAS) outline detection image segmentation