5 Conclusion

An ACO-based image edge detection algorithm that takes advantage of the improvements introduced in ACS has been successfully developed and tested. Experimental results show the feasibility of the approach in identifying edges in an image. With suitable parameter values, the algorithm was able to successfully identify edges in the canonical test images. It must be noted that the appropriate parameter values depend on the nature of the image, and thus, may vary per application.

As a continuation of this research, it is recommended to further examine how the quality of the extracted edges is affected by the parameter values and the functions for obtaining the heuristic information, for quantifying the quality of a solution, and for computing how much pheromone to deposit. In a study on a simplified ACO algorithm [11], it was shown that the basic properties of ACO are critical to the success of the algorithm, especially when solving more complex problems.

In recent studies, techniques that could enhance the performance of ACS have been explored. In [12], ants are assigned different pheromone sensitivity levels, which makes some ants more sensitive to pheromone than the others. In [13], multiple ant colonies with new communication strategies were employed. The proposed ACS method for edge detection could be extended and possibly be improved by making use of such techniques.

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