**Edge Detection using Bacteria Foraging**

**& Fuzzy Similarity Measure**

**Major Project submitted in partial fulfillment of the**

**requirements for the award of degree of**

**Master of Technology**

**Information Systems**

Submitted By:

**Ajay Kumar**

**(01/IS/09)**

Under the Guidance of:

**Prof. O. P. Verma**

**(HOD, IT Department)**

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**Department of Information Technology**

**Delhi Technological University**

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# *CERTIFICATE*

This is to certify that **Mr. Ajay Kumar (01/IS/09)** has carried out the major project titled “**Edge Detection using Bacteria Foraging & Fuzzy Similarity Measure**” as a partial requirement for the award of Master of Technology degree in Information Systems by Delhi Technological University.

The major project is a bonafide piece of work carried out and completed under my supervision and guidance during the academic session **2009-2011**.

The matter contained in this report has not been submitted elsewhere for the award of any other degree.

(Project Guide)

**Prof. O.P. Verma**

Head Of Department

Department of Information Technology

Delhi Technological University

Bawana Road, Delhi-110042

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Ajay Kumar

# 01/IS/09

M. Tech. (Information System)

Department of IT

E-mail: akaggarwal36@yahoo.in

**ABSTRACT**

Edges characterize boundaries and edge detection is one of the most difficult tasks in image processing hence it is a problem of fundamental importance in image processing. Edges in images are areas with strong intensity contrasts and a jump in intensity from one pixel to the next can create major variation in the picture quality. Edge detection of an image significantly reduces the amount of data and filters out useless information, while preserving the important structural properties in an image. In the proposed method, the bacteria foraging is used along with contemporary fuzzy logic which implements a relative pixel similarity value algorithm.The similarity between two pixels is calculated using the weighted participation of each fuzzy rule. Low similarity between the pixels represents the probability of a pixel to be an edge pixel. The bacteria moves over the low similarity region, thus maximizing the edge content while minimizing the presence of non-edge content in the movement path. Directional Pixel Similarity is used to locate the similar pixel to the edge pixel and thus the movement of bacteria is decided. Bacteria with sufficient nutrients are reproduced, i.e., at the intersection of more than one edge a bacterium will split into the number of edges. If a bacterium found itself low on nutrients than it will be eliminated from its current location and dispersed to some other location. The path traced by the bacteria is the edge map. Thus with proposed method, edge pixels in a color image are detected simultaneously without any complex calculations such as gradient, Laplace and statistical calculations.

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