Experiment No:9 Fuzzy Logic - Image Processing

Aim:

The aim of implementing fuzzy logic for edge detection is to enhance the robustness and accuracy of edge detection in images by handling uncertainities in pixel intensity transactions.

Procedure:

Procedure for Fuzzy Logic Edge Detection

1. Set up the Environment
   1. Open MATLAB: Ensure you have access to MATLAB with the image processing toolbox and fuzzy logic toolbox installed.

Step2: Import and convert image to Grayscale
   1. Read the RGB Range
   2. Convert to Grayscale

Step3: Convert image to double-precision data
   1. convert to double

Step 4: Obtain image gradient
   1. Define Gradient filters:
   2. Calculate Gradients
   3. Plot image gradients

Step5: Define fuzzy inference system (FIS) for edge detection
   1. Create FIS
   2. Add inputs
   3. Define Membership function for inputs
   4. Add output
   5. Define Membership function for outputs
   6. Plot Membership function

Step 6: Specify FIS Rules

1. Add Rules for FIS

Step 7: Evaluate FIS

1. Evaluate edge detection

Step 8: Plot Results.

1. Plot Original Grayscale Image
2. Plot detected edges.

Output

Result:

The program was successfully executed and the DIP is verified.