Lossy Polynomial/DCT-based Contour Approximation and Compression Source Code Run Instruction

About

This source code package belongs to the DISP Lab, Graduate Institute of Communication Engineering, National Taiwan University, led by Professor Jian-Jiun Ding < jjding@ntu.edu.tw>.

Files

- "Polynomial method" directory
  1. Main_Polynomial_on_MPEG7_dataset.m
  2. Main_Polynomial_on_Zalik_dataset.m

     These two files are the main functions of the polynomial contour approximation of two different datasets. One can modify the parameters in these files and run the program.
  3. Other p-files

     The p-file is the protected format of the m-file of MATLAB. Although one cannot read the function code in these p-files, we will provide interfaces of some usable functions below.
- "DCT method" directory
  1. Main_DCT_on_MPEG7_dataset.m
  2. Main_DCT_on_Zalik_dataset.m

     These two files are the main functions of the DCT-based contour approximation of two different datasets. One can modify the parameters in these files and run the program.
  3. Other p-files

     The p-file is the protected format of the m-file of MATLAB. Although one cannot read the function code in these p-files, we will provide interfaces of some usable functions below.
- "Common functions" directory

  This directory contains the common functions used in both algorithms.
- "Zalik dataset" directory

  This directory contains the test images provided by B. Zalik.
- "MPEG7 dataset" directory

  This directory contains the test images provided by R. Ralph.

Run the Program

- The m-files "Polynomial method" and "DCT method" directories are runnable script files.
- To select different test images, adjust the variable "*choose*."
- To run under different parameters, follow the comments in the files.

Encode/Decode Function Interfaces

- Encoding

Input:

edgex	A 1**Nc* cell, each cell is a 1**L* array indicating the x-coordinate of each contour. *Nc* is the number of contours in the image. *L* is the length of each curve.
edgey	A 1**Nc* cell, each cell is a 1**L* array indicating the y-coordinate of each contour. *Nc* is the number of contours in the image. *L* is the length of each curve.
M	Height of the image.
N	Width of the image.
Below parameters are optional	
OpenFlag	A 1**Nc* array indicating whether each contour is open (1) or closed (0).
cross	A *n**2 matrix, each row is a coordinates of a cross point, the cross points must be selected as dominant point. *n* is the number of cross points.
pn	1. the order of the polynomial for approximation. 2. the number of coefficients retaining for the DCT.
eth	The adjustable threshold of the approximation error.
q	The quantization factor.

Output:

Code	The compressed bit stream
x_apx	A 1**Nc* cell, each cell is a 1**L* array indicating the approximated x-coordinate of each contour.
y_apx	A 1**Nc* cell, each cell is a 1**L* array indicating the approximated y-coordinate of each contour.
DPx	A 1**Nc* cell, each cell is a 1**Ndp* array indicating the x-coordinates of the dominant points of each contour. *Ndp* is the number of dominant points in each curve.
DPy	A 1**Nc* cell, each cell is a 1**Ndp* array indicating the y-coordinates of the dominant points of each contour.

- Decoding

Input:

Code	The compressed bit stream
M	Height of the image.
N	Width of the image.
Below parameters are optional	
pn	1. the order of the polynomial for approximation. 2. the number of coefficients retaining for the DCT.
eth	The adjustable threshold of the approximation error.
q	The quantization factor.

Output:

x_apx	A 1**Nc* cell, each cell is a 1**L* array indicating the approximated x-coordinate of each contour.
y_apx	A 1**Nc* cell, each cell is a 1**L* array indicating the approximated y-coordinate of each contour.
DPx	A 1**Nc* cell, each cell is a 1**Ndp* array indicating the x-coordinates of the dominant points of each contour. *Ndp* is the number of dominant points in each curve.
DPy	A 1**Nc* cell, each cell is a 1**Ndp* array indicating the y-coordinates of the dominant points of each contour.