Adavance Data Structures Lab (20XD37)

Semester – III Final Package

Abstract

Team Members:

22PD02 – Ahalyanjuna S

22PD09 - Chaithanya N

22PD10 – C.Poorvika

Topic:

IMAGE COMPRESSION (in Python)

Data Structures Used:

QUAD TREES

Libraries Used:

[1].numpy

- used for performing operations on image pixels.

- to work with image data in the form of Numpy arrays.

- calculating average color.

- histogram computation.

[2].PIL (Python Imaging Library)

- used to preform various image related tasks.

- Image opening and loading.

- Image resizing.

- Quadtree-Based image compression.

- Creating images and GIF’s.

[3].tkinter

- used for creating graphical user interfaces and to create simple interactive applications with buttons,menus,windows and some visual elements.

[4].filedialog

- module provided by tkinter library used for opening file dialogs.Allows users to select files from the system.

Classes and functions Used:

[1].average\_colour

- To convert image to numpy array storing pixel colour.

- To get average of whole image.

[2].Class Quadrant

\_\_init\_\_ - cropping image to quadrant size.

split\_quadrant - splitting root quadrant into 4 new quadrants and adding new quadrants to root children.

[3].Class QuadTree

\_\_init\_\_ - keeps track of max depth achieved by recursion.

* And starts compression.

- building of quad tree.

create Image - create blank image canvas and draws rectangle size of quadrant for each leaf quadrant.

get\_leaf\_quadrants - search recursively down the quadtree and appends if quadrant is a leaf otherwise recursion is continued.

Create\_gif – creates gif.

[4].Class GIFPlayer

[5].Open image create

- create quadtree and create image with custom depth for compressed images.

- opens required image and gets compressed and saves into the specified file path.

[6].main

- loads image.

- displays the compressed image.

Abstract:

This provided python script presents a versatile image compression and playback system(gif) using Quadtree algorithm with both interactive and automated functionalities.

The code allows users to open an image of thir choice and applies Quadtree-based compression with a specified depth,and generates a GIF showcasing the compression process.

The compression is controlled by parameters such as maximum depth,detail threshold and size multiplier.

It offers a user-friendly interface for image selection and compression customization.making it a useful tool for image processing and visualization.