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HOW IT WORKS

The application consists of two parts – image processor (image_processing.py) and graphical interface (gui.py). These two files were updated to meet the requirements for the 2nd lab and placed into GitHub repository, so is README file with requirements and launching instructions.

An updated application (.exe) was built, but since it is too heavy to be loaded to GitHub, it will be demonstrated during presentation.

gui.py is a PySimpleGUI-based user interface. It imports functions from image_processing.py displays an image, lets the user choose functions and parameters, and calls these functions for currently displayed image.

- Left-side panel for adjusting function parameters;
- Elements in the top for loading/saving images, operating with image history and choosing function.

image_processing.py is a collection of image-processing functions implemented with OpenCV/NumPy/matplotlib.

New functions in image_processing.py:

- Hough lines;
- Hough circles;
- Local stats;
- Seed texture segment.

TESTING RESULTS

Loading image:

Hough lines with different settings:

Parameters:
Threshold:
Otsu blur ksize:
CLAHE clip:
CLAHE tiles (w,h):
Stretch low %:
Stretch high %:
Blur ksize:
Blur sigma:
Unsharp k:
Unsharp sigma:
Unsharp amount:
Unsharp threshold:
Lap k:
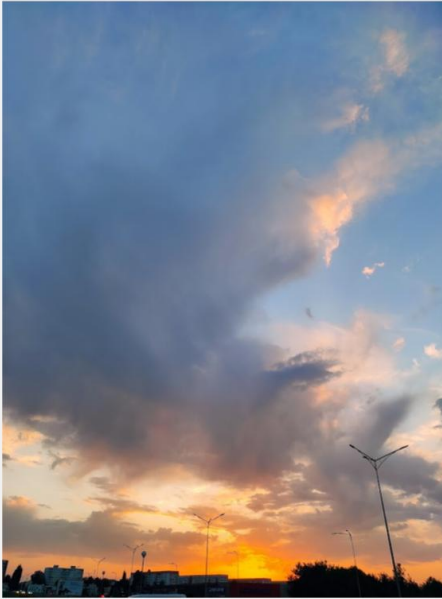Lap alpha:
Sobel k:
Shift X: Shift Y:
Angle:
Edge thr:
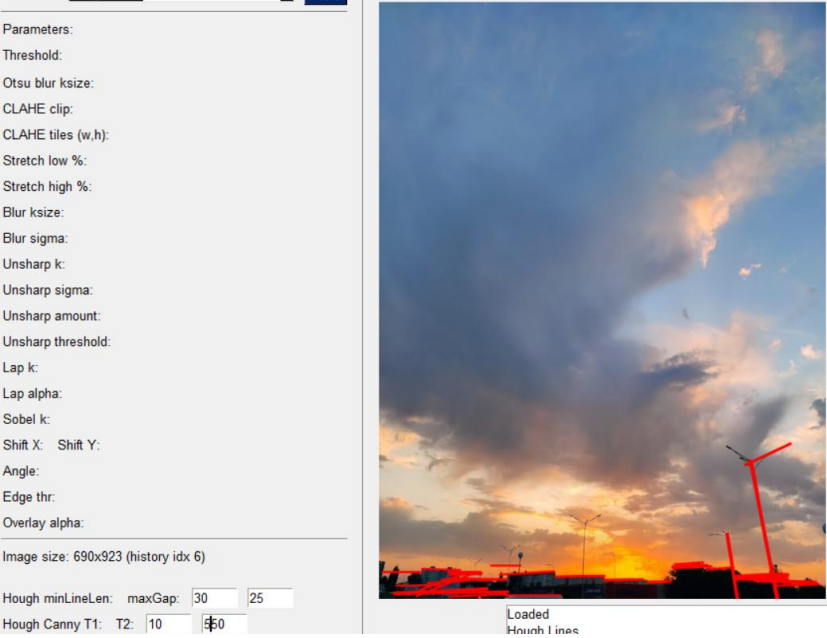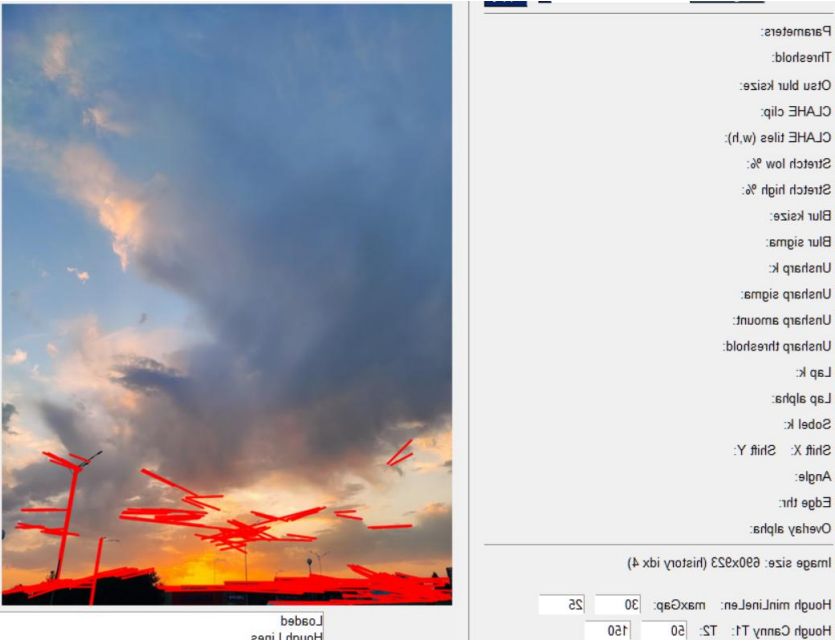Overlay alpha:

Image size: 690x923 (history idx 6)

Hough minLineLen: maxGap: 30   25
Hough Canny T1:   T2:   10   550

Loaded
Hough Lines

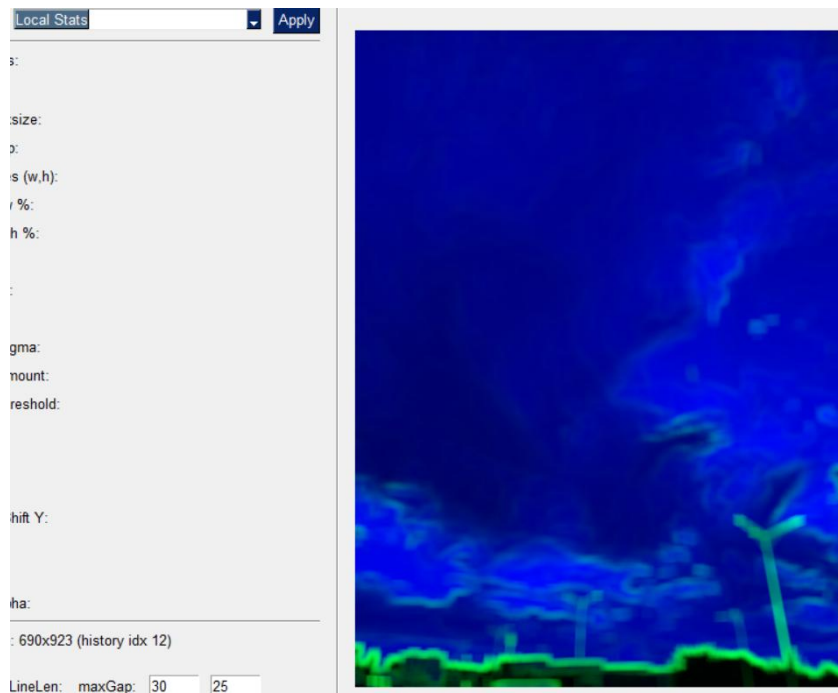Hough circles with different settings:

Parameters:
Threshold:
Otsu blur ksize:
CLAHE clip:
CLAHE tiles (w,h):
Stretch low %:
Stretch high %:
Blur ksize:
Blur sigma:
Unsharp k:
Unsharp sigma:
Unsharp amount:
Unsharp threshold:
Lap k:
Lap alpha:
Sobel k:
Shift X: Shift Y:
Angle:
Edge thr:
Overlay alpha:

Image size: 690x923 (history idx 10)

Hough minLineLen: maxGap: 30 25
Hough Canny T1: T2: 10 550
Hough dp: minDist: 1.2 20
param1: param2: 150 10
minR: maxR: 0 0

History (latest last):
Loaded
Hough Lines
Hough Lines
Reset -> original
Hough Lines
Reset -> original

Local stats:

s:

size:
p:
s (w,h):
r %:
h %:

gma:
mount:
reshold:

hift Y:

ha:
: 690x923 (history idx 12)

LineLen: maxGap: 30   25

Seed texture segment:

s:

size:
x:
s (w,h):
r %:
h %:

gma:
mount:
reshold:

hift Y:

ha:
: 690x923 (history idx 14)

LineLen: maxGap: 30   25