EMMETRA INTERNSHIP OPPORTUNITY

Instruction Guide

TEAM MEMBERS:

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PREREQUISITES

Matlab Software

- Version 2019a or higher

MATLAB Add-Ons:
- Image Processing Toolbox
- Deep Learning Toolbox
- Parallel Computing Toolbox

Python
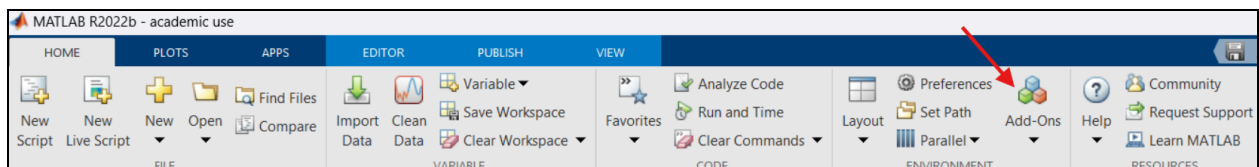
- Version 3.8.0 or higher

Required Python Libraries:
- OpenCV (Version used: 4.10.0.84) or higher
- Numpy (Version used: 1.24.4) or higher
- Pillow (Version used: 10.4.0) or higher
- Matplotlib (Version used: 3.7.5) or higher
- Streamlit (Version used: 1.40.1) or higher
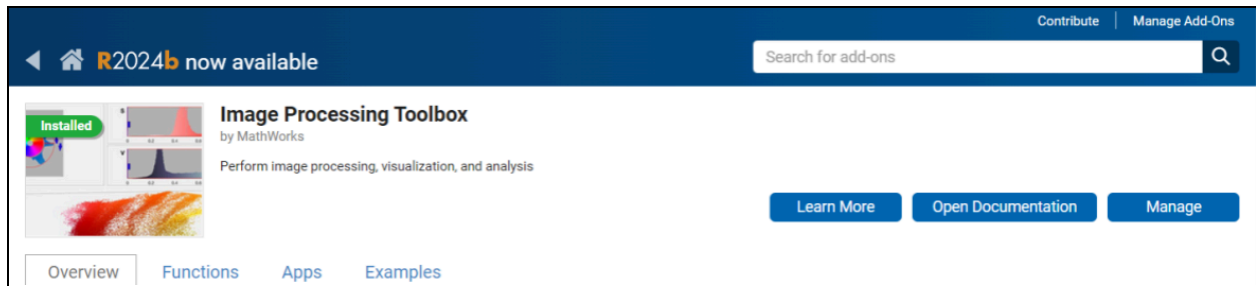
PROCEDURE

MATLAB Setup (Steps 1-5) :

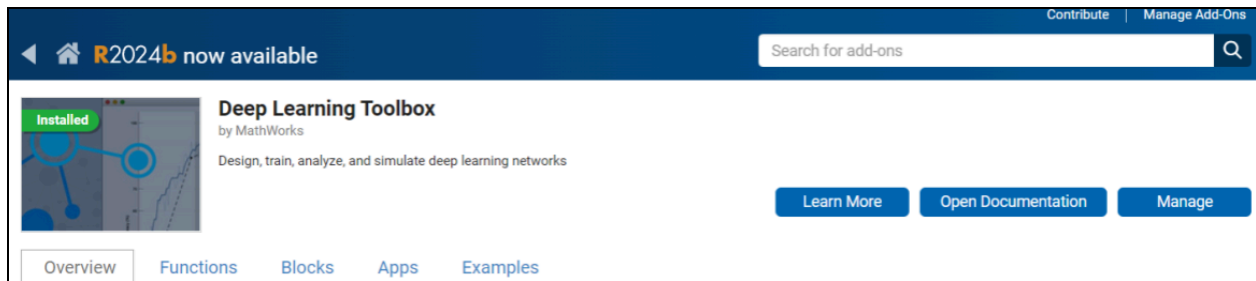1. Open MATLAB.

2. Click on Add-Ons.

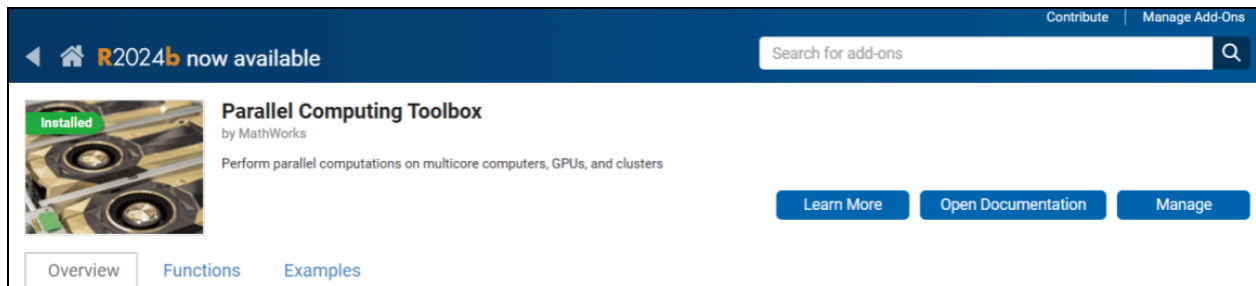3. Search for the required toolboxes in the search bar and Install:
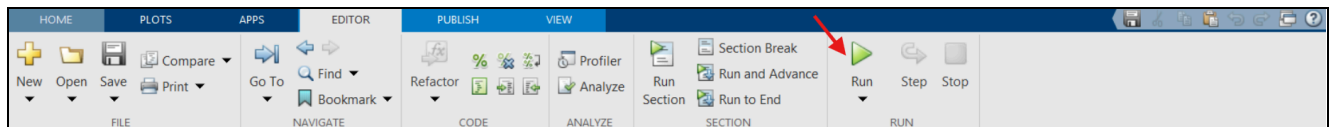
(a) Image Processing Toolbox

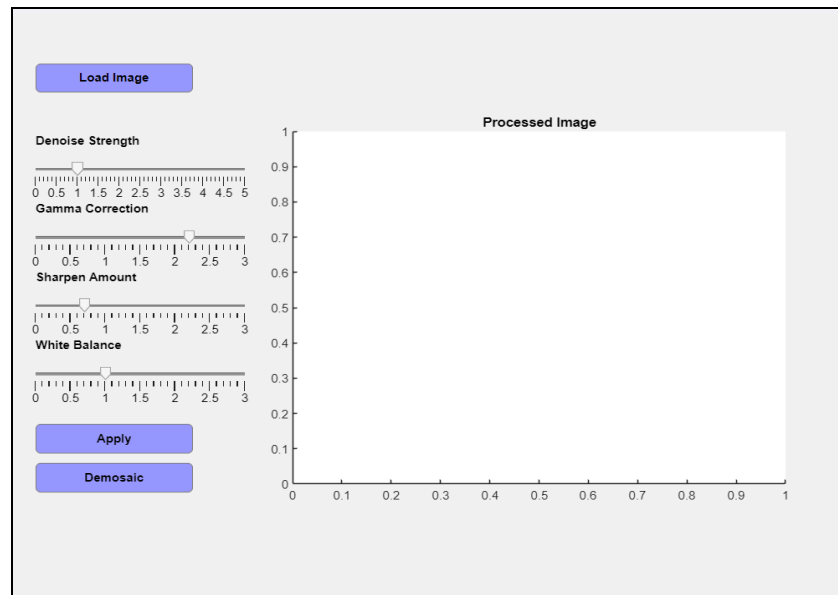

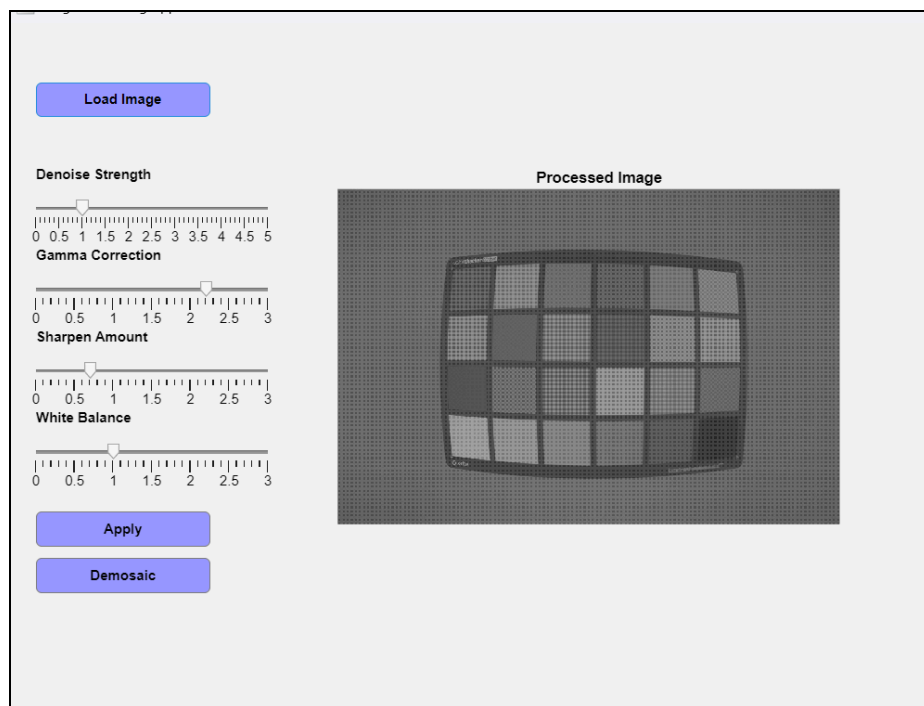(b) Deep Learning Toolbox

(c) Parallel Computing Toolbox

4. Close the Add-on Explorer.

5. Open the respective file containing the code and click on Run in the Editor tab.
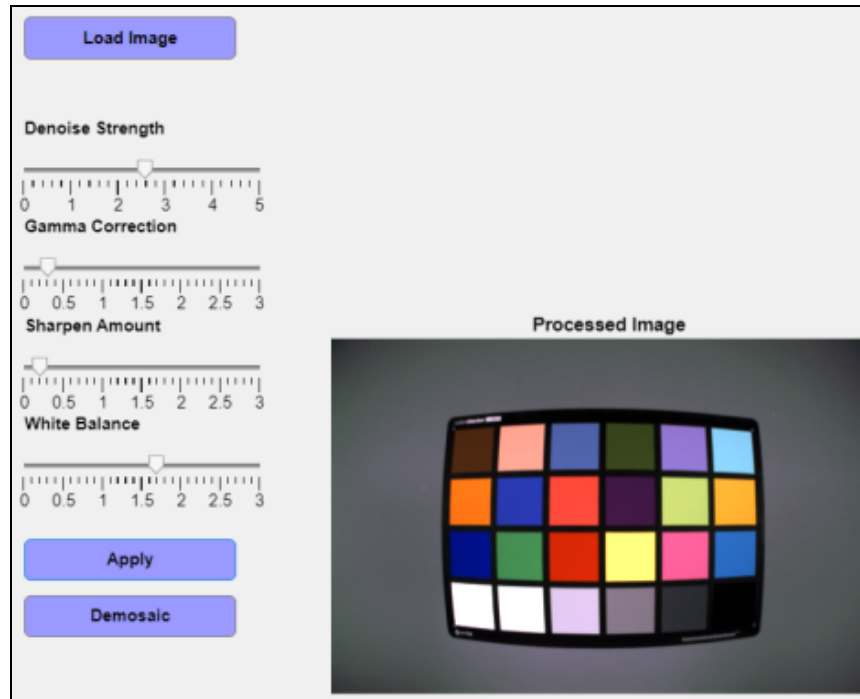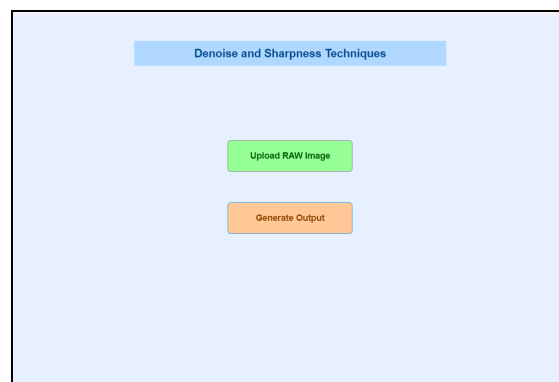
6. For Assignment 1:

6.1. Click on load image and upload the RAW image from your system directory
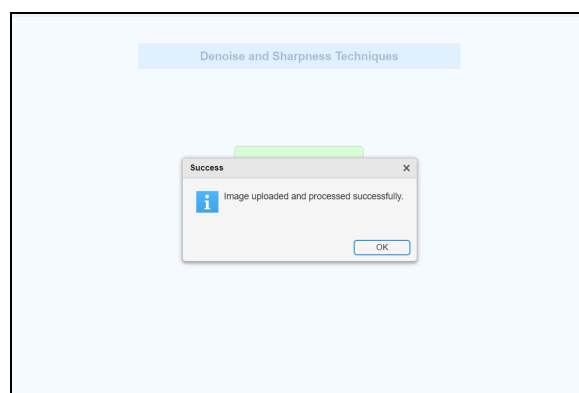

6.2. Click on demosaic and adjust the parameters through the sliders according to your desired output
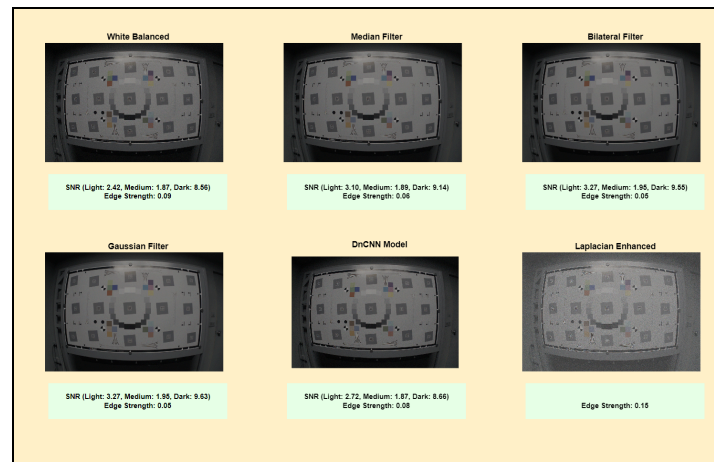
7. For Assignment 2:

7.1. Click on upload RAW Image and select the desired file from your system

7.2. Click on OK and then Generate Output to view the results (output will take around 8-10 seconds to process)

8. For Assignment 3:

8.1. Clone or download the project.

(To clone run `git clone https://github.com/BlankParry/Emmetra-Assignments` in your terminal/command prompt).

8.2. In your terminal/command prompt, navigate to the project directory using `cd Emmetra-Assignments\Assignment-3`

Then run `pip install -r requirements.txt` to install all the required libraries.

8.3. The default input images referenced in the code can be found in the **test-data** folder. If you wish to use your own images, update the filenames in **HDR_Imaging.py** accordingly to match your image file names.

```
 5
 6    # Input image filenames          CHANGE THE FILENAMES IN "HDR_Imaging.py" TO MATCH YOUR IMAGE FILE NAMES
 7    #img_fn = ["../Test data/metro-1.jpeg", "../Test data/metro-2.jpeg", "../Test data/metro-3.jpeg"]
 8    #img_fn = ["../Test data/room-1.jpg", "../Test data/room-2.jpg", "../Test data/room-3.jpeg"]
 9    img_fn = ["../Test data/terrace-1.jpeg", "../Test data/terrace-2.jpeg", "../Test data/terrace-3.jpg"]
10    img_list = [cv.imread(fn) for fn in img_fn]
11    exposure_times = np.array( object: [0.04, 0.005, 0.01], dtype=np.float32)
```

(Ensure that the image files are present in the same directory as the **HDR_Imaging.py** file. If not, use absolute/relative file paths to reference the images in your code.)

8.4.   Run `cd src` in the terminal/command prompt to navigate to the source code directory.

8.5.   Run the command `python -m streamlit run HDR_Imaging.py`, in the terminal/command prompt to execute **HDR_Imaging.py.**

8.6.   The Streamlit application will open in your default browser (or provide a URL in the terminal to access it).
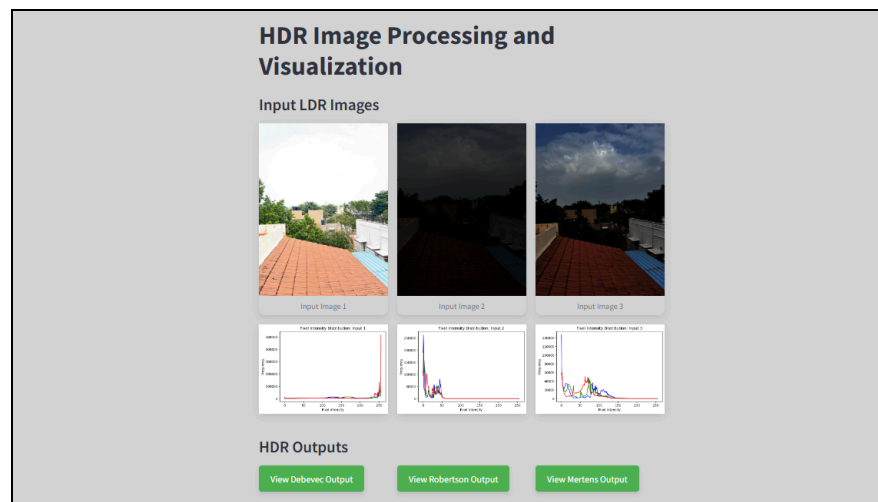
8.7.   Use the **View Debevec Output, View Robertson Output** and **View Mertens Output** buttons to explore the HDR outputs.