

CSCI 6527 – Introduction to Computer Vision

Assignment 1 - Image sensing and digital image

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All photos for the given assignment were taken on iPhone 14 Pro Max. The photos were taken with the main camera of the device which has the following characteristics 48MP sensor, 24 mm focal length, $f/1.78$ aperture. Although the camera has a 48 MP sensor it doesn't really take 48MP photos instead it divides the pixels into groups of four and combines the four in each group into one larger pixel, so what we get is 12MP photo. This is done to get brighter photos with less image noise. The resolution of each photo in this report is 3024×4032 pixels. In terms of saved file format and encoding, up to 2017 all Apple devices used to save photos in JPEG format, but starting from 2017 and iPhone 7, the saved file format is HEIF (High Efficiency Image File Format) for photos and this file is wrapped into HEIC (High Efficiency Image Container) that can store multiple images along with meta data that describes each image as a collection in a single file. The advantage of this file format is it can be used for burst photo to be saved as a single file, also portrait mode photos which are using info from several cameras of device and combine it into single image. The name generation technique that is used is quite simple, the name of the generated file is IMG_0000.HEIC where 0000 is substituted by 4 digits that are working by the logic of the auto increment, and when auto increment reaches 9999, it creates a new folder and starts the counter from 0. Color space of the photos that are taken is RGB, and the color profile is Display P3. Display P3 is a color space created by Apple. It uses the DCI-P3 primaries, but instead of the ~ 6300 K white point, Display P3 uses the CIE standard illuminant D65 as the white point.

To save originality of the taken photos, night mode and post processing of the photos were turned off as much as the system allows it.



Daylight Noon: IMG_4111.HEIC

Date and Time: March 8, 2023 at 3:44 PM

Focal length: 6.86 mm

Exposure time: 1/155

Size: 1.2 MB



Daylight Evening: IMG_4120.HEIC

Date and Time: March 8, 2023 at 8:07 PM

Focal length: 6.86 mm

Exposure time: 1/20

Size: 511 KB



Fluorescent Dim: IMG_4188.HEIC

Date and Time: March 12, 2023 at 9:13 PM

Focal length: 6.86 mm

Exposure time: 1/30

Size: 879 KB



Fluorescent Bright: IMG_4191.HEIC

Date and Time: March 12, 2023 at 9:13 PM

Focal length: 6.86 mm

Exposure time: 1/46

Size: 802 KB