Report:

1. Demo1 [Efficiency in creating single frame image]

We test the creation of foveated image on seveal images and test the run time, and the result is shown in the table below:

For RGB images:

|  |  |  |  |
| --- | --- | --- | --- |
| ImageName | Fv obj creation time(ms) | Im Recon time(ms) | Series Recon time(ms) |
| Flower1.jpg | 0.283 | 5.00 | 0.0949 |
| dt.jpeg | 0.300 | 3.71 | 0.0588 |
| Wallstreet.jpg | 0.341 | 4.37 | 0.108 |
| D1.jpeg | 0.277 | 3.60 | 0.0805 |

For grayscale image:

|  |  |  |  |
| --- | --- | --- | --- |
| ImageName | Fv obj creation time(ms) | Im Recon time(ms) | Series Recon time(ms) |
| Flower1.jpg | 0.269 | 3.53 | 0.0490 |
| dt.jpeg | 0.267 | 3.53 | 0.0663 |
| Wallstreet.jpg | 0.309 | 3.27 | 0.0915 |
| D1.jpeg | 0.265 | 3.38 | 0.0482 |

As we can see in the table, the average object creation time is from around 0.26ms to 0.35ms, which is significantly smaller than the refresh rate of most webcams(16ms/frame). Thus the project is capable of image processing in video streams.

The efficiency improvement from RGB to grayscale is not as large as expected (only about 15% in most cases). So processing everything in RGB format will be a better choice considering that it carries 3 times information of gray scale images.

Demo2: [Efficiency in creating foveated video stream]

We record the run time of each frame creation, the result is stored in file **frameTime.xlsx**. We record 141 total frames, and result in a 8.39ms average runtime for each frame, which is much smaller than the requirement of a 60fps webcam.