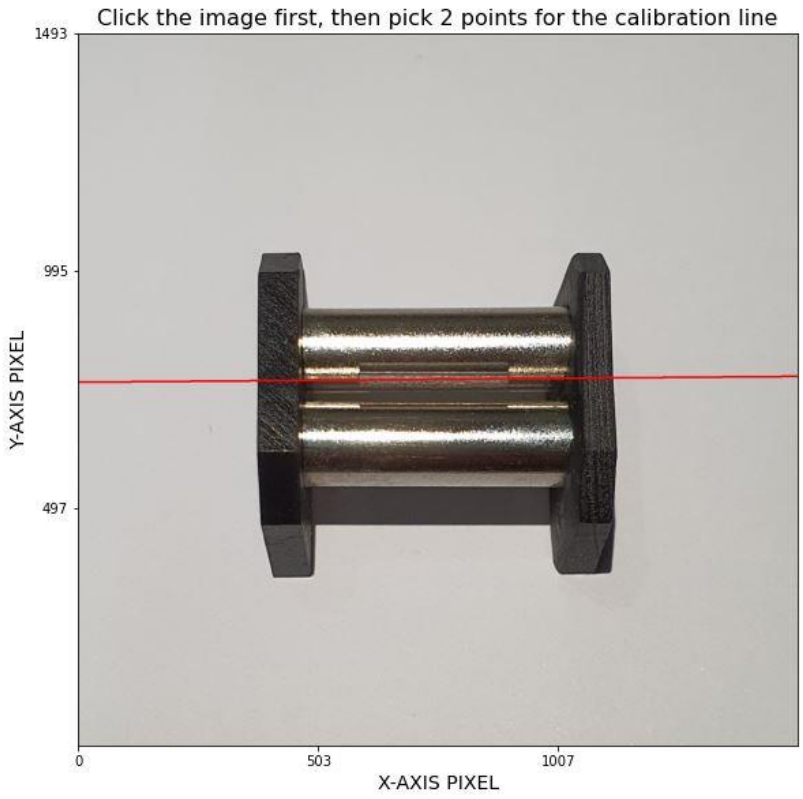
Program is available for free in GitHub link: https://github.com/nixonwidjaja/PDL-Oscillation.git

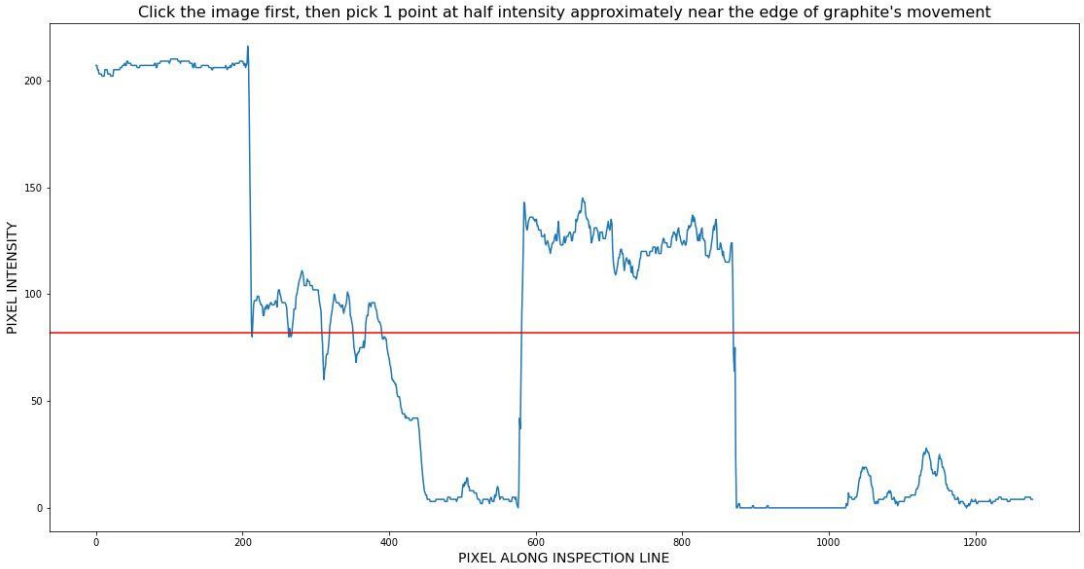
How Does Our Python Program Do the Work?

- First, the program will read the video we had recorded and extract its frames. We should realize that a video is basically lots of frames or images combined together.
- The program will show the first frame of the video and ask us to pick two points for inspection line. It will detect the brightness intensity of the pixels in our inspection line. The intensity ranges between 0 and 255. After it detects the intensity, the program can deduce the position of the graphite, and thus be able to plot its position with respect to time.
- Then, the program will ask us to pick two points for length calibration. We type in the actual length between two points we selected from the image.

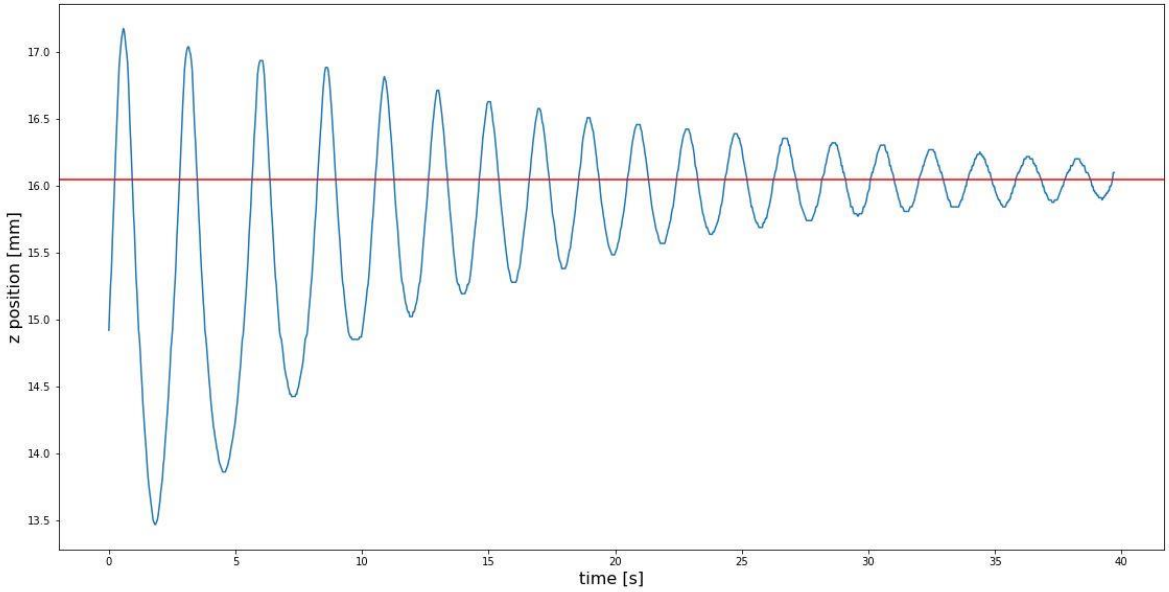


- The program will show a graph of intensity versus the pixels in our inspection line. We will observe a curve with intensity maxima. The program will then ask us to pick a point at half intensity approximately near the edge of graphite's movement.

- The program will analyze the position of the graphite by finding the graphite's boundary in every frame of the video.



- After the program finishes, the program will show a graph of the position of the graphite versus time elapsed during its oscillation.



- We will also obtain the oscillation period, frequency, and damping constant.
- Finally, the program will export the oscillation data into text file.