TASK2

Signal processing and Machine Learning

SUBDOMAIN : Control Systems

PROBLEM STATEMENT:

You work for a start-up which specializes on Augmented Reality. A client wants to do the following task. He wants a car to be present on his visiting card when shown to a camera. After doing this, you find that, the output is so staggering and unstable, and you are also asked to implement a software based stabilizing method to counter this problem.

DETAILED EXPLANATION:

The client's visiting card has an aruco marker on it. You are asked to replace the aruco marker with an object (innovative concepts will be rewarded). You find that the video after implementing augmented reality becomes unstable and some frames are skipped due to various reasons. In order to make the video cleaner and stable, you are required to devise an algorithm to make the transition between frames smooth.

EVALUATION METRICS:

- **Implementation and accuracy of ArUco scanning.**
- **Quality of the rendered video using OpenGL and innovativeness in replacement object.**
- **The implementation and accuracy of stabilization algorithm.**

SUBMISSION:

- **Videos showing the real time working of the task**
- **Image processing and Augmentation Code**
- **An abstract on the working principles and implementation**

RESOURCES:

1. A sample video output: https://www.youtube.com/watch?v=wzN_YPlB3fA
2. OpenCV's documentation on aruco: https://docs.opencv.org/3.1.0/d5/dae/tutorial_aruco_detection.html
3. OpenGL beginner's tutorials: https://pythonprogramming.net/opengl-rotating-cube-example-pyopengl-tutorial/