

Experiment 5: Design and Implement Multiple Object Tracking Using OpenCV

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Aim:

To implement multiple object tracking using OpenCV by recording a video from the webcam.

Code:

```
from IPython.display import display, Javascript
from google.colab.output import eval_js
from base64 import b64decode
import cv2
import numpy as np

# JavaScript to record video from webcam
def record_video(filename='webcam_video.mp4'):
    js = Javascript("""
    async function recordVideo() {
        const div = document.createElement('div');
        const capture = document.createElement('button');
        capture.textContent = 'Start Recording';
        div.appendChild(capture);
        document.body.appendChild(div);

        const stream = await navigator.mediaDevices.getUserMedia({video: true});
        const recorder = new MediaRecorder(stream);
        const chunks = [];

        recorder.ondataavailable = e => chunks.push(e.data);
        recorder.onstop = e => {
            const blob = new Blob(chunks, {type: 'video/mp4'});
            const reader = new FileReader();
            reader.onload = () => {
                google.colab.kernel.invokeFunction('notebook.saveVideo', [reader.result], {});
            };
            reader.readAsDataURL(blob);
        };

        capture.onclick = () => {
            recorder.start();
            capture.textContent = 'Stop Recording';
            capture.onclick = () => {
                recorder.stop();
                stream.getVideoTracks()[0].stop();
            };
        };
    }

    recordVideo();
    """)
    display(js)

video_data = None
def save_video(data):
```

```
global video_data
video_data = data

from google.colab import output
output.register_callback('notebook.saveVideo', save_video)

record_video()
```

Result:

The experiment successfully captured a video from the webcam. The recorded video can now be used for multiple object tracking applications using OpenCV, which involves detecting and tracking multiple objects across video frames.