#### Project: Object Detection and Classification in a Video

**Objective**: Build a simple application that detects and classifies objects in a video stream.

**Target Audience**: Beginners interested in learning object detection and classification.

**Technical Skills**: Basic programming knowledge (Python preferred), familiarity with libraries like OpenCV (optional).

**Project Scope:**

Choose Object Classes: Select 2-3 common object classes to detect, such as cars, people, or animals.

Dataset and Model: Select a pre-trained object detection model suitable for your chosen classes (e.g., YOLOv5, TensorFlow Lite models). You can find pre-trained models online or train your own with dedicated datasets.

**Implementation**:

1. Import necessary libraries (OpenCV, model API).
2. Load the pre-trained model.
3. Capture video stream from webcam or file.
4. For each frame in the video:
5. Run object detection on the frame using the model.
6. Draw bounding boxes around detected objects with class labels.
7. Display the processed frame.
8. Consider adding features like:
9. Object counting
10. Real-time performance metrics
11. Saving output video

**Evaluation**:

**Test your application on various videos with diverse lighting, angles, and distances. Assess the accuracy and robustness of object detection and classification**.

**Deliverables**:

1. Python code implementing the project.
2. A short report summarizing the project, including:
3. Chosen object classes and model.
4. Implementation details.
5. Evaluation results and any challenges encountered.

**Optional Extensions:**

* Implement object tracking.
* Classify objects based on specific attributes (e.g., color, size).
* Integrate your application with a real-world scenario (e.g., traffic monitoring, people counting).

**Learning Outcomes:**

Gain practical experience with object detection and classification.

Understand the workflow of building a computer vision application.

Explore pre-trained models and their capabilities.

Experiment with different libraries and functionalities.

**Remember**:

Choose a project scope that matches your comfort level and available time.

Document your code and thought process clearly.

Use online resources and tutorials to learn new concepts.

Have fun and be creative!

*Bonus: Create a video showcasing your project and share it online!*

I hope this project assignment inspires you to explore the exciting world of computer vision!