Seminar and Technical Communication (STC)

TITLE

## Evaluating Computer Vision And OCR Based Solutions For Helmet Detection And License Plate Recognition

ABSTRACT

This work is focused on designing and evaluating a system that identifies motorcycle riders not wearing helmets and extracts their license plate numbers using computer vision techniques. The core objective is to explore and compare multiple approaches for both object detection and optical character recognition to determine the most effective configuration for this task.

At the detection stage, the project will involve experimenting with different algorithms, such as YOLOv5, YOLOv7, Detectron, to identify key objects including riders, helmets, and license plates. At the recognition stage, OCR engines like Tesseract and EasyOCR will be tested for their ability to accurately extract text from detected license plate regions. The system will include pre-processing steps such as filtering to enhance OCR results.

Each combination of detection and recognition methods will be evaluated using a dataset of annotated motorcycle images. Evaluation criteria will include detection accuracy, OCR precision, processing speed, and implementation complexity. By comparing these techniques systematically, the work aims to identify a solution that balances performance with practicality.

The outcome will be an analysis of which method combinations are most effective for helmet violation detection and license plate recognition.

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