Driver Distraction Detection

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Submitted to:
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Problem Statement

Goal: Develop a system that automatically detects driver distraction from in-cab images, alerting if the driver's attention deviates from safe driving behavior.

Approach

Component	Details
Datasets	https://www.kaggle.com/c/state-farm-distracted-driver-detection
Tools	Tensorflow
Custom Implementation	Implement Custom CNN model and then try transfer learning Models: VGG19, EfficientNet-B3

Experiments List

- •Data Augmentation Study

Techniques: Random rotation, brightness variation, horizontal flip.
Goal: Measure robustness to real-world lighting/camera angles.

- Baseline Transfer Learning

Models: VGG19, EfficientNet-B3 (pretrained on ImageNet)
Metric: Validation accuracy .

- Custom CNN Training

Architecture: will try different architectures of convolutional, dense layers, batch normalization & dropout.
Metric: Accuracy, inference time per image.

Success Criteria & Expected Insights

Success: Achieve $\geq 80\%$ validation accuracy.
Expected Outcome:
• Transfer learning like VGG19 and EFficentnetB3 might outperform the custom CNN in accuracy but may incur higher inference cost.
• Data augmentation should significantly improve performance on varied lighting.
• Real-world testing will reveal gaps in model generalization, guiding further data collection or domain adaptation.