

Drowsy Driver Detection

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Problem Statement

- Safety Imperative: Address the pressing concern of **drowsy driving**, a significant contributor to road accidents and fatalities.
- Driver drowsiness poses significant risks, causing over **100,000 accidents** in the U.S. annually
- Transfer Learning Impact: Leverage **transfer learning with ResNet-50 and MobileNet**, bolstering drowsy driver detection through pre-trained models and customized layers for heightened accuracy and improved road safety.

Approach

Pre Processing

Image Resizing

Color Channel Adjustment

Data Augmentation

Modelling

Transfer Learning
Integration

Customized Architecture

Evaluation and
Refinement

Model Evaluation

Metric Selection

Validation and Testing

Comparative Analysis

Resnet 50

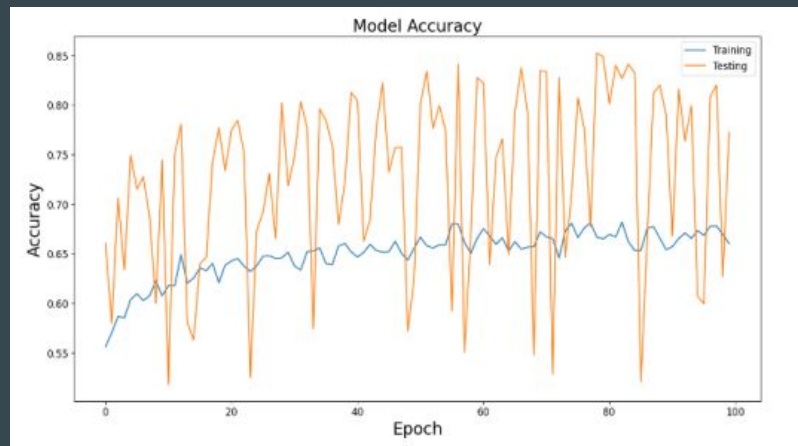
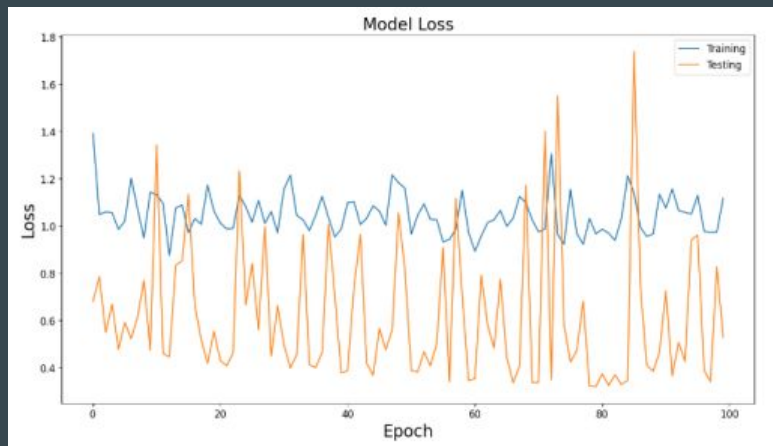
- **Deep and Robust:** ResNet-50's 50+ layers allow it to capture intricate features, making it apt for complex tasks like drowsy driver detection.
- **Gradient Efficiency:** Residual connections in ResNet-50 mitigate vanishing gradients, ensuring efficient training and faster convergence.
- **Pre-Trained Advantage:** Leveraging ImageNet pre-trained weights accelerates feature extraction from driving images, even with limited data.

Mobile Net

- **Efficient Design:** MobileNet's lightweight structure ensures real-time drowsy driver detection.
- **Fast Inference:** Depthwise separable convolutions enable quick processing without compromising accuracy.
- **Pre-Trained Advantage:** Leveraging ImageNet pre-trained weights boosts performance with limited data.
- **Deployment Readiness:** MobileNet's efficiency suits real-world drowsiness detection, even in resource-limited scenarios.

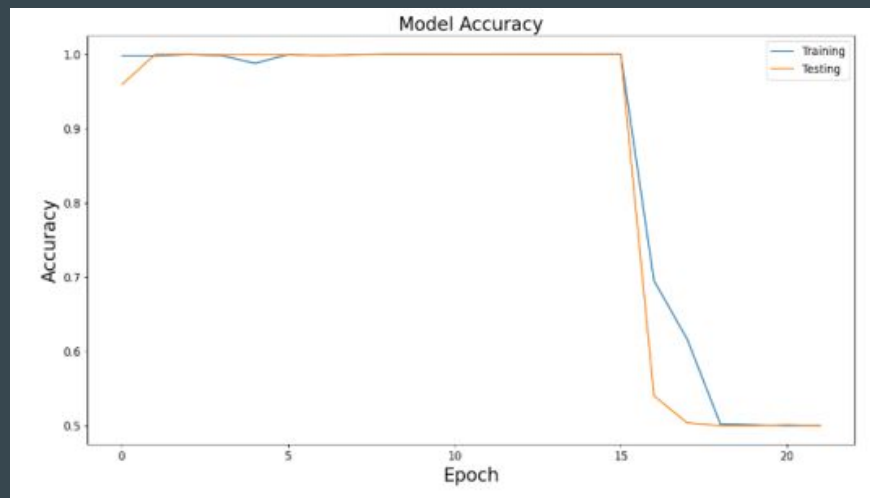
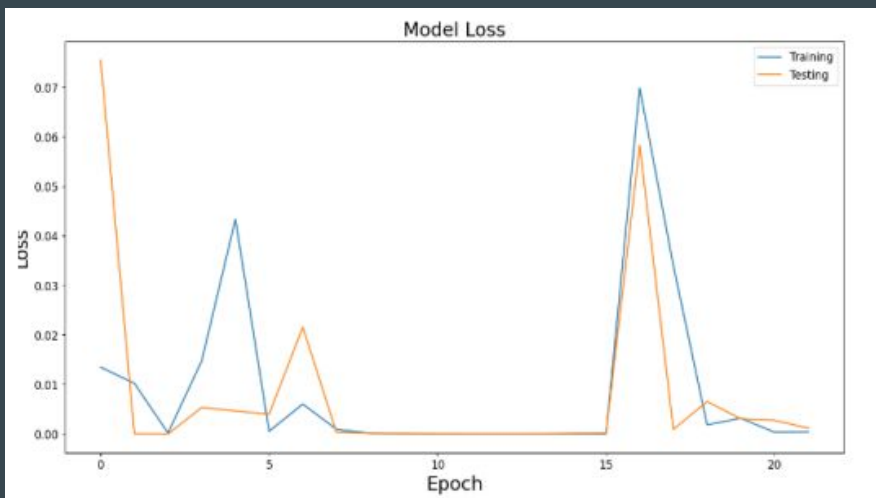
RESNET 50 Results

	Precision	Recall	F1-Score	Support
Class 0	0.99	0.55	0.71	1000
Class 1	0.69	0.99	0.81	1000
Accuracy			0.77	2000
Macro Avg	0.84	0.77	0.76	2000
Weighted Avg	0.84	0.77	0.76	2000



Mobile Net Results

	Precision	Recall	F1-Score	Support
0	1.00	1.00	1.00	1000
1	1.00	1.00	1.00	1000
Accuracy			1.00	2000
Macro Avg	1.00	1.00	1.00	2000
Weighted Avg	1.00	1.00	1.00	2000



Conclusion

- **Impactful Solution:** Our project's drowsy driver detection system offers a tangible contribution to road safety.
- **Effective Transfer Learning:** Leveraging pre-trained models and custom enhancements demonstrated improved accuracy and efficiency.
- **Real-World Applicability:** The optimized models show potential for practical deployment in real-time driving scenarios.
- **Continual Advancements:** Our work underscores the ongoing potential for refining and expanding AI-driven safety solutions.

Questions?