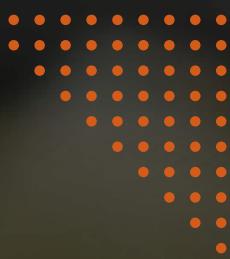


# Enhancing Karooooo's AI Dashcams with Convolution Neural Networks

A Vision for Karooooo



Presented by Matthew Bowyer – UOEO



# From:





TO:

- Faster Reaction Time
- Reduced Mental Load
- Improved Safety
- Enhanced Fleet Monitoring
- Market Differentiation





# Data set overview

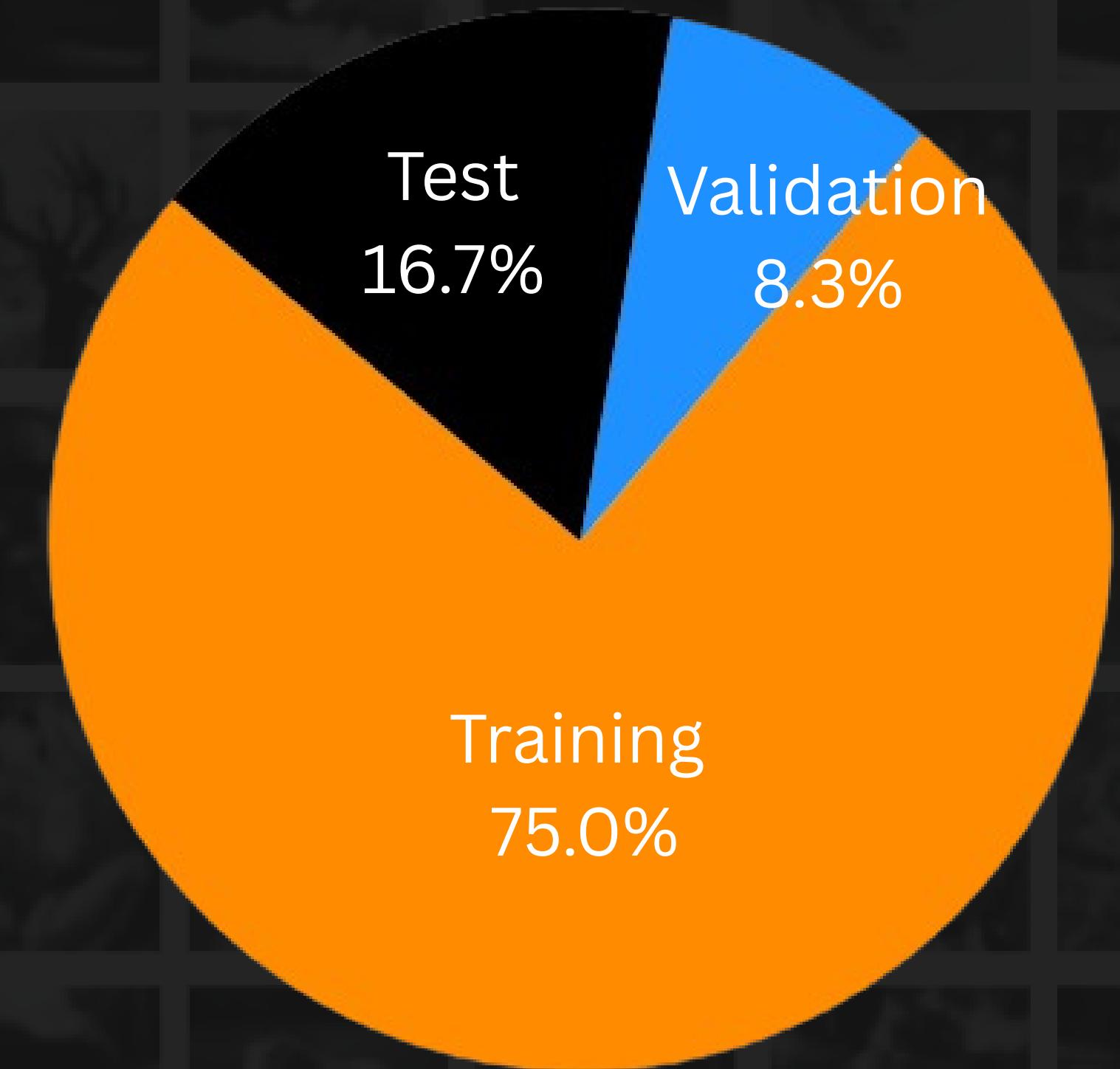
## CIFAR-10





# Dataset

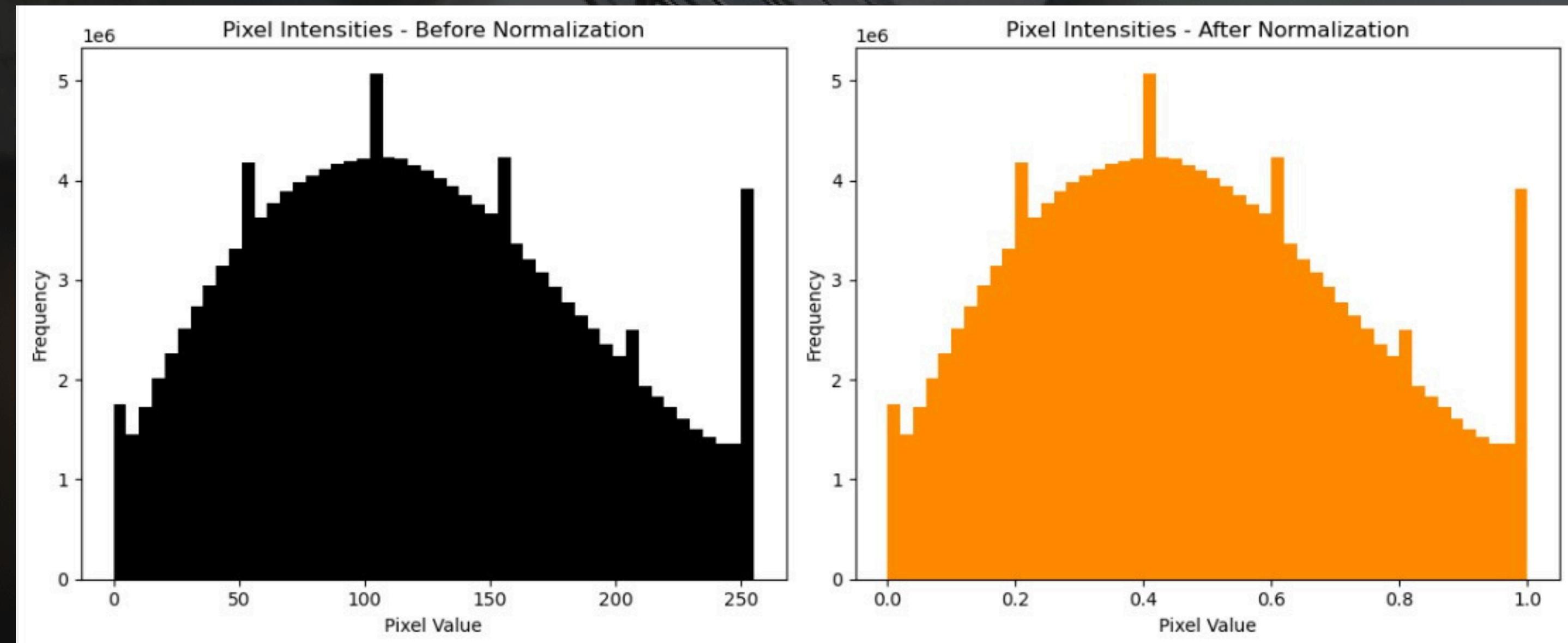
Split by Image Count





# Pixel Intensities

## Pre and Post Normalization





# One-hot encoding

Original

Gender
Male
Female
Male
Male

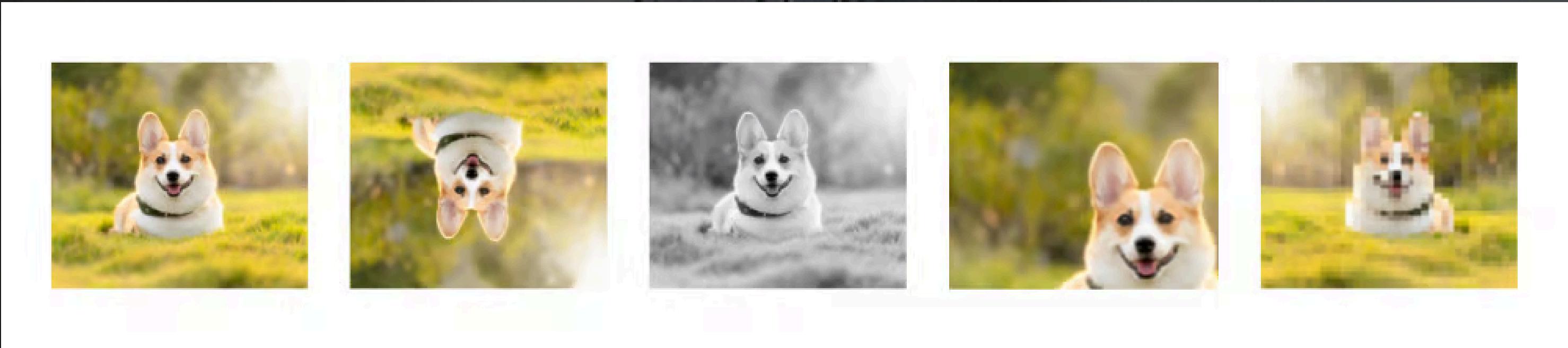


One-hot encoded

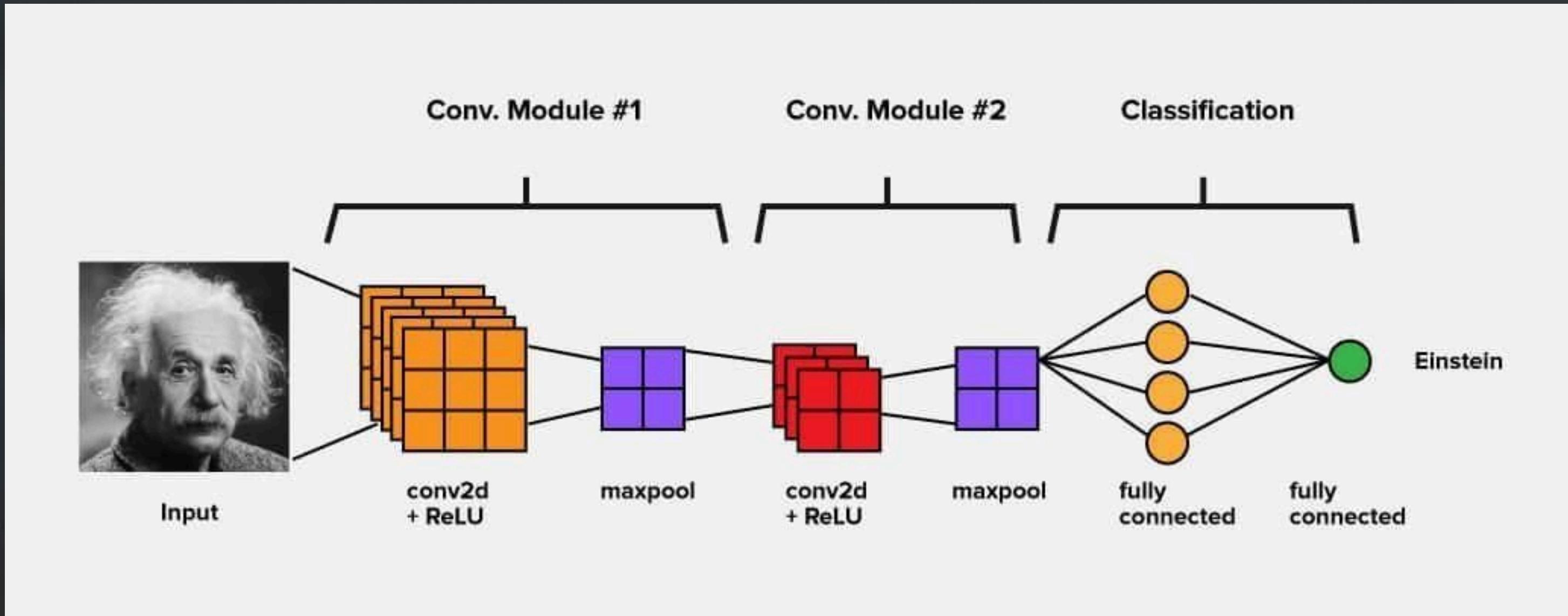
Gender	Male	Female
Male	1	0
Female	0	1
Male	1	0
Male	1	0



# Data Augmentation



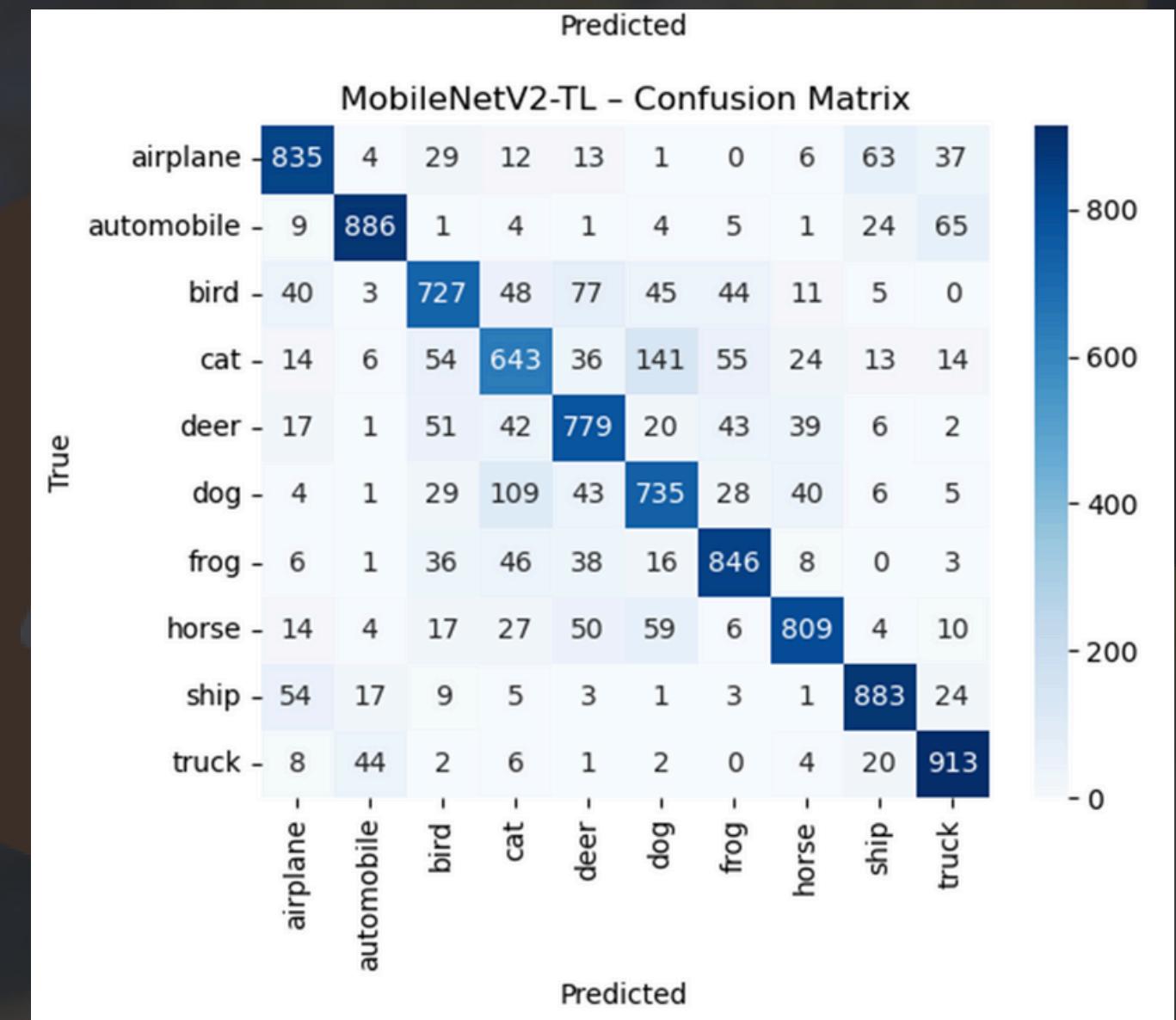
# Convolution Neural Networks (CNN)



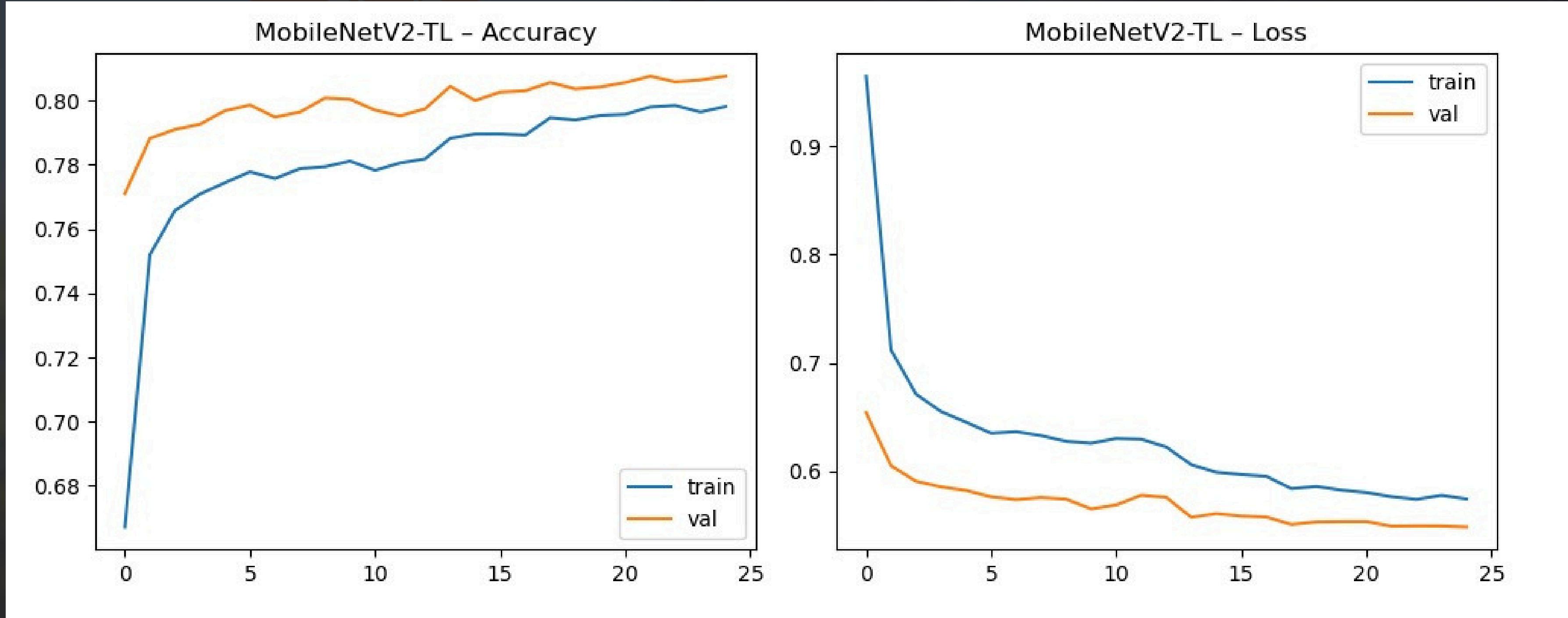
<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>
Simple model	MobileNetV2	ResNet-50
No Transfer Learning	Transfer Learning	Transfer Learning
<ul style="list-style-type: none"> <li>• RGB images, 32x32 input layer</li> <li>• Adam optimizer</li> <li>• Categorical cross entropy</li> <li>• ReLU in all hidden layers</li> <li>Final dense layer activated by SoftMax</li> </ul>	<ul style="list-style-type: none"> <li>• RGB images, 32x32 input layer</li> <li>• Adam optimizer</li> <li>• Categorical cross entropy</li> <li>• ReLU in all hidden layers</li> <li>Final dense layer activated by SoftMax</li> </ul>	<ul style="list-style-type: none"> <li>• RGB images, 32x32 input layer</li> <li>• Adam optimizer</li> <li>• Categorical cross entropy</li> <li>• ReLU in all hidden layers</li> <li>Final dense layer activated by SoftMax</li> </ul>
30 epochs	25 epochs	20 epochs
800 000 trainable parameters	2.3 million trainable parameters	23 million trainable parameters
Batch size 128	Batch size 96	Batch size 64
Learning rate 0.001	Learning rate 0.001	Learning rate 0.0005

# Model Evaluation

Measurement	Model 1	Model 2	Model 3
Accuracy	69%	81%	32%
Precision	70%	81%	34%
Recall	69%	81%	32%
F1 Score	69%	81%	29%
MCC	0.66	0.78	0.25



# Model Evaluation



# RoadMap





# Thank You

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