Food Spoilage Classification Using Transfer Learning With EfficientNet
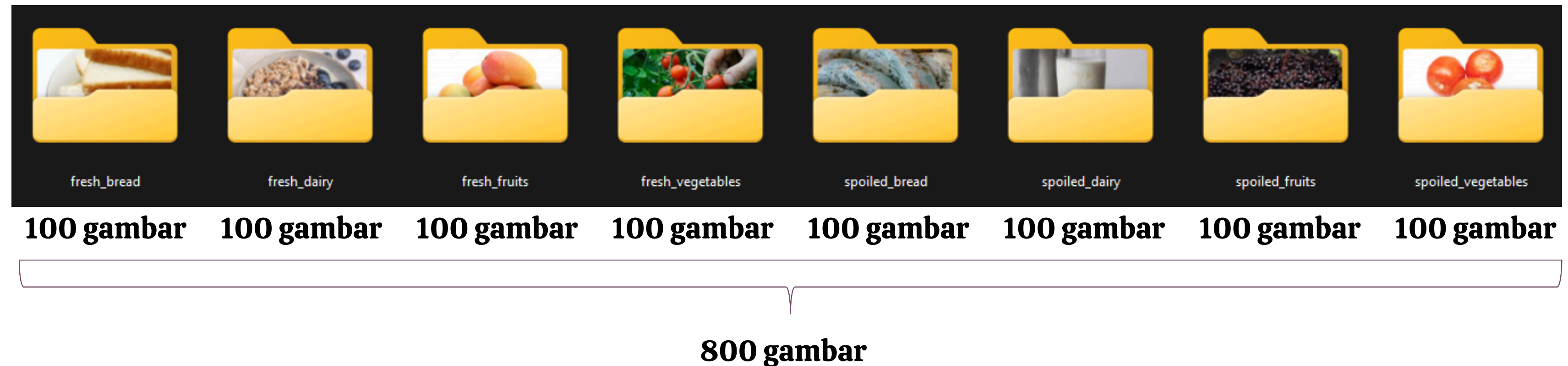
Graidvel Vladen Gomar Gama

Problem Background

In most supermarkets, a lot of spoiled products are usually ignored or passed. Manual checking on which is fresh and which is spoiled are also subjective and inefficient. With AI, this classification can be more efficient and effective.

DATASET

Dataset yang digunakan:

fresh_bread	fresh_dairy	fresh_fruits	fresh_vegetables	spoiled_bread	spoiled_dairy	spoiled_fruits	spoiled_vegetables
100 gambar	**100 gambar**	**100 gambar**	**100 gambar**	**100 gambar**	**100 gambar**	**100 gambar**	**100 gambar**

800 gambar

Model

```python
EffNet = EfficientNetB0(
    include_top = False,
    weights = 'imagenet',
    input_shape = (IMG_SIZE[0], IMG_SIZE[1], 3)
)
```

```python
EffNet.trainable = True


for layer in EffNet.layers[:-20]:
        layer.trainable = False
```

```python
data_augmentation = tf.keras.Sequential([
    layers.RandomFlip("horizontal"),
    layers.RandomRotation(0.2),
    layers.RandomZoom(0.2),
    layers.RandomContrast(0.1)
])
```

```python
Model = models.Sequential([
    layers.Input(shape = (224, 224, 3)),
    data_augmentation,
    EffNet,
    layers.GlobalAveragePooling2D(),
    layers.Dropout(0.2),
    layers.Dense(1, activation = 'sigmoid')
])
```

Model
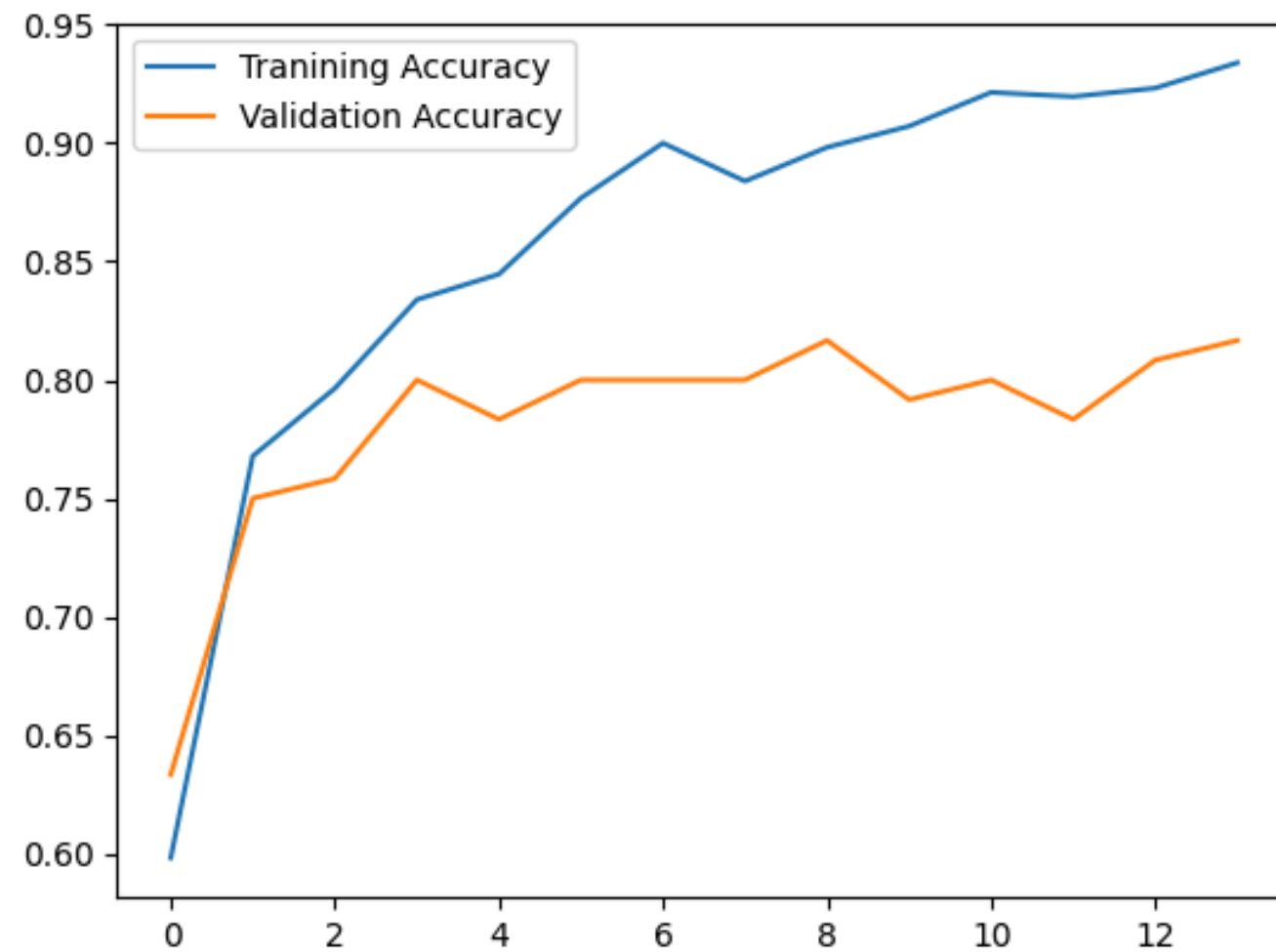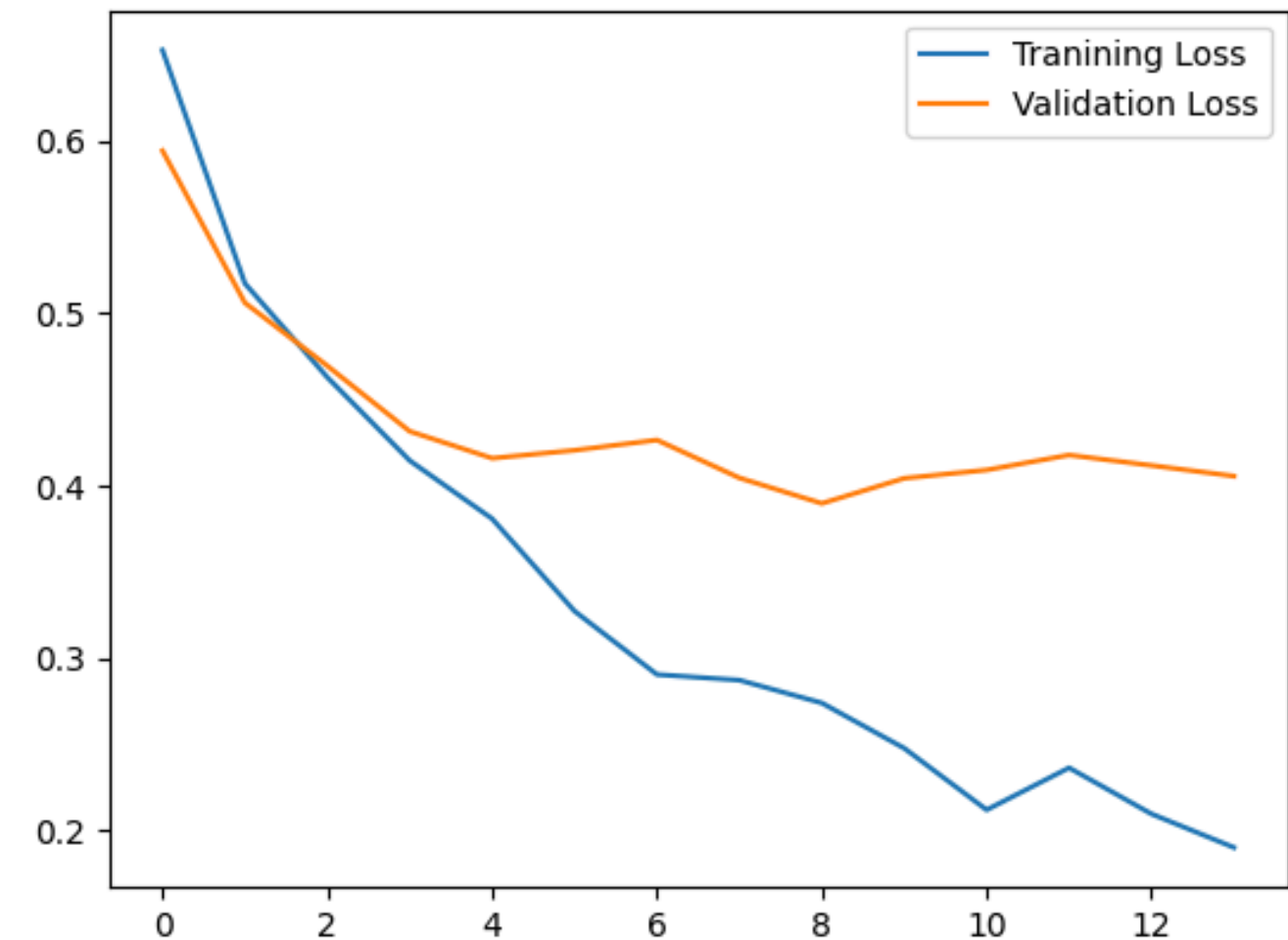


```
data_augmentation = tf.keras.Sequential([
    layers.RandomFlip("horizontal"),
    layers.RandomRotation(0.2),
    layers.RandomZoom(0.2),
    layers.RandomContrast(0.1)
])
```

```
EffNet = EfficientNetB0(
    include_top = False,
    weights = 'imagenet',
    input_shape = (224, 224, 3)
)
```

Input

Data_augmentation

EffNet

GlobalAveragePooling2D()

Dropout(0.2)

Dense(1, sigmoid)

Evaluation

Accuracy Score   :0.5834
Precision Score   :0.578125

Recall Score   :0.6167
F1 Score   :0.5968

Demo

Due to file type limitation, please search for "Demo.mp4" in the repository.

Reflections

Kekuatan komputasi kurang → Dataset kecil → Kemungkinan overfitting lebih tinggi

Namun, model ini masih bisa menjadi dasar atas model–model klasifikasi yang lebih compleks.