

## Model Development Phase Template

Date	24 June 2025
Team ID	SWTID1750316859
Project Title	ASL - Alphabet Image Recognition
Maximum Marks	10 Marks

### Initial Model Training Code, Model Validation and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include a summary and training and validation performance metrics for multiple models, presented through respective screenshots.

### Initial Model Training Code (5 marks):

#### MobileNet-V2:

```
# 🚀 Train
history = model.fit(
    train_gen,
    steps_per_epoch=train_gen.samples // CFG.batch_size,
    validation_data=val_gen,
    validation_steps=val_gen.samples // CFG.batch_size,
    epochs=CFG.epochs,
    callbacks=[checkpoint, earlystop]
)
```

#### VGG16:

```
# Load VGG16 model and modify for ASL recognition
base_model = VGG16(weights='imagenet', include_top=False, input_shape=(224, 224, 3))

for layer in base_model.layers:
    layer.trainable = False

x = base_model.output
x = Flatten()(x)
x = Dense(512, activation='relu')(x)
x = Dropout(0.5)(x)
x = Dense(512, activation='relu')(x)
x = Dropout(0.5)(x)
predictions = Dense(29, activation='softmax')(x)

model = Model(inputs=base_model.input, outputs=predictions)

display(model.summary())
display(tf.keras.utils.plot_model(model, to_file='vgg16.png', show_shapes=True))
```

### Training and Validation Performance Metrics

[illegible]

```

round 10000 validated image filenames belonging to 29 classes.
round 13000 validated image filenames belonging to 29 classes.
round 16000 validated image filenames belonging to 29 classes.
./utils/visualize.py:12:6: DeprecationWarning: Please use `trainer/data_adapters/py_dataset_adapter.py:121: UserWarning: Your 'PyDataset' class should
self.warm_up_super_net_callback()
Epoch 1/10
1/99 [====>] 3:36:52 161/step - accuracy: 0.8047 - loss: 5.2526

```