

## INTRODUCTION

*Kuih* has existed as an integral part of Malaysian cuisine since the 15th century<sup>(1)</sup>. Over the years, its popularity rose steadily, asserting its place at the epicenter of Malaysia's rich cultural scene.

There is **no** single AI model that specialises in the identification of different types of *kuih* currently. Moreover, current image-based identification models (i.e., Google Lens, TinEye, etc.) lack specialisation in this area.

## AIMS

- Collect images of 8 different types of *kuih* in **different settings** for a diverse dataset
- Develop an **AI model** that can accurately identify different types of *kuih*

## METHODS

We incorporated the following data augmentation methods to our raw image data. Some of the methods include:

- Standard **flips** and **rotations**
- Moderate **colour jittering**
- Small **random erasing**

The flow-chart below shows a detailed account of our development process. The model selected for this project is the **EfficientNetV2-S**. The model was trained through **transfer learning**.

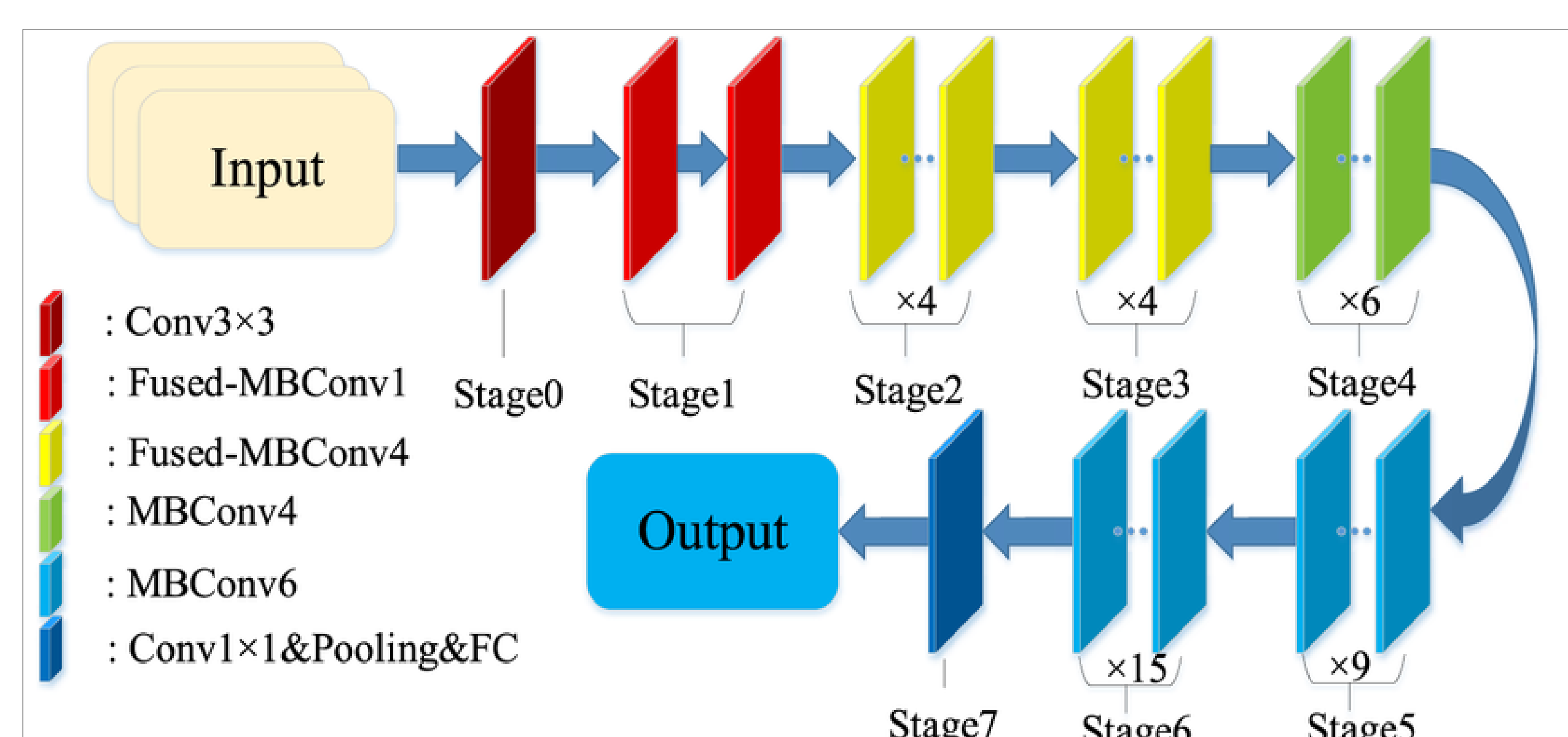
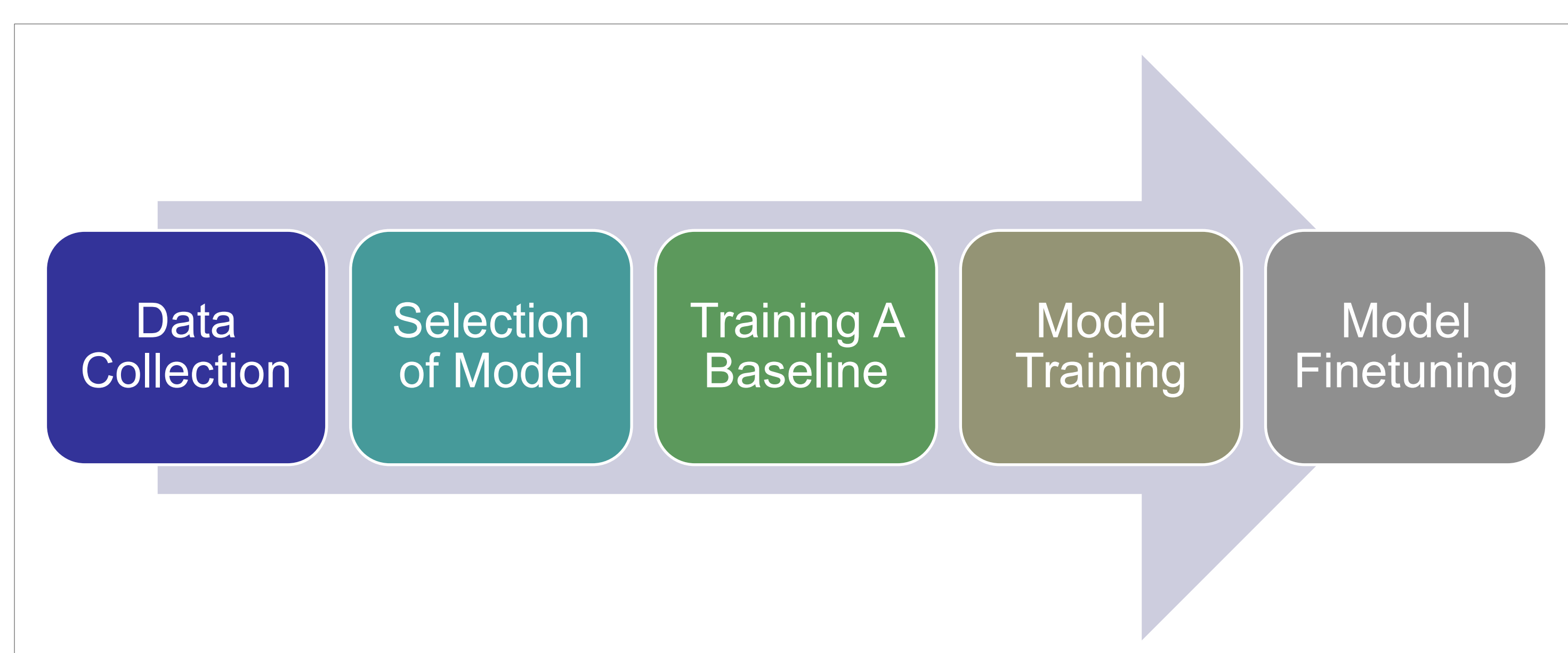


Fig. 1.2: Model Architecture of EfficientNetV2-S

## RESULTS

Some of the final stats:

- Baseline Accuracy:** 57%
- Validation Accuracy:** 98%
- Validation Time:** 0.25s / image
- Test Accuracy:** 100%
- Test Time:** 0.15s / image
- Model Size:** 213 MB



Prototype Showcase

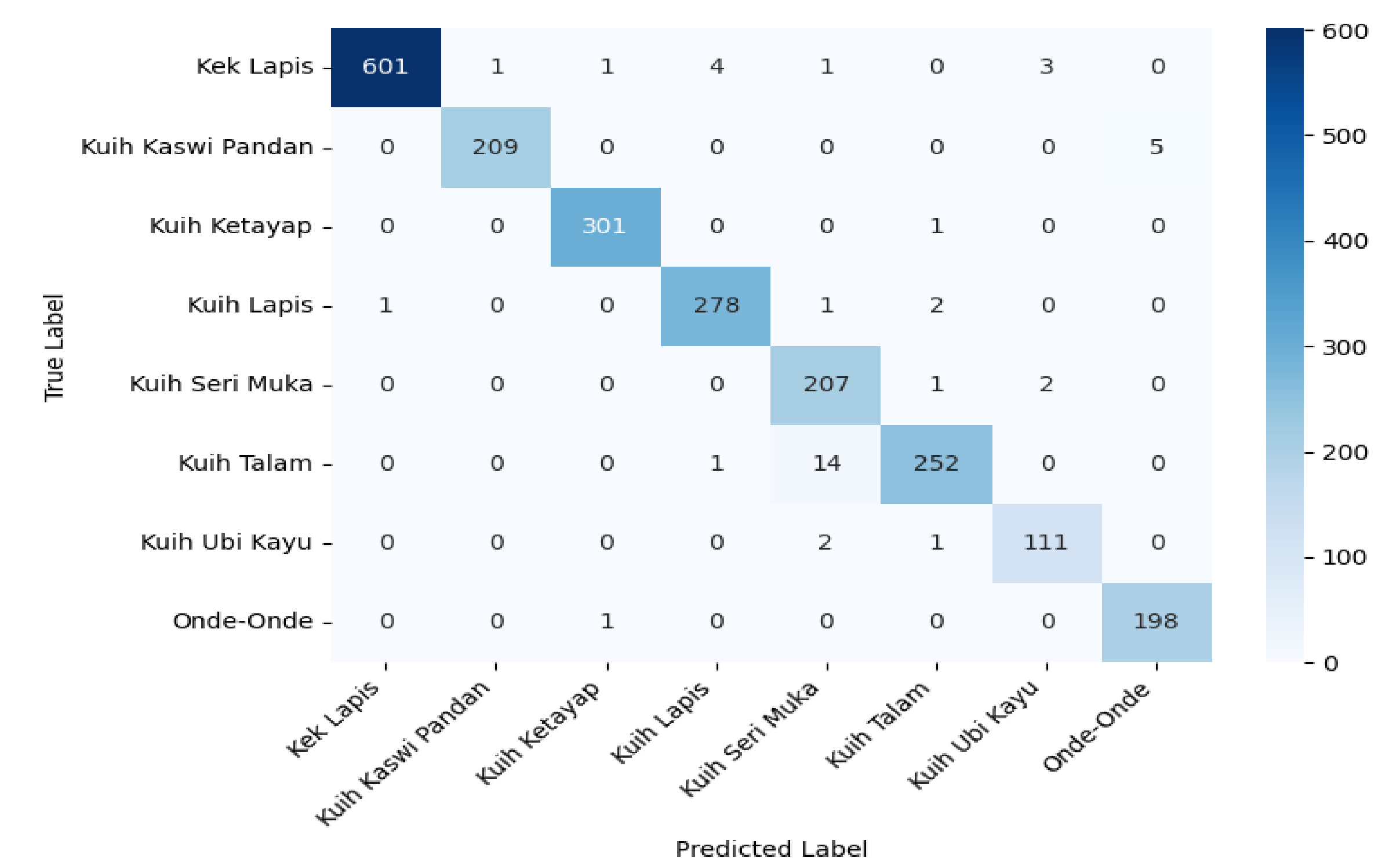


Fig 2.1 Confusion Matrix of Validation Data

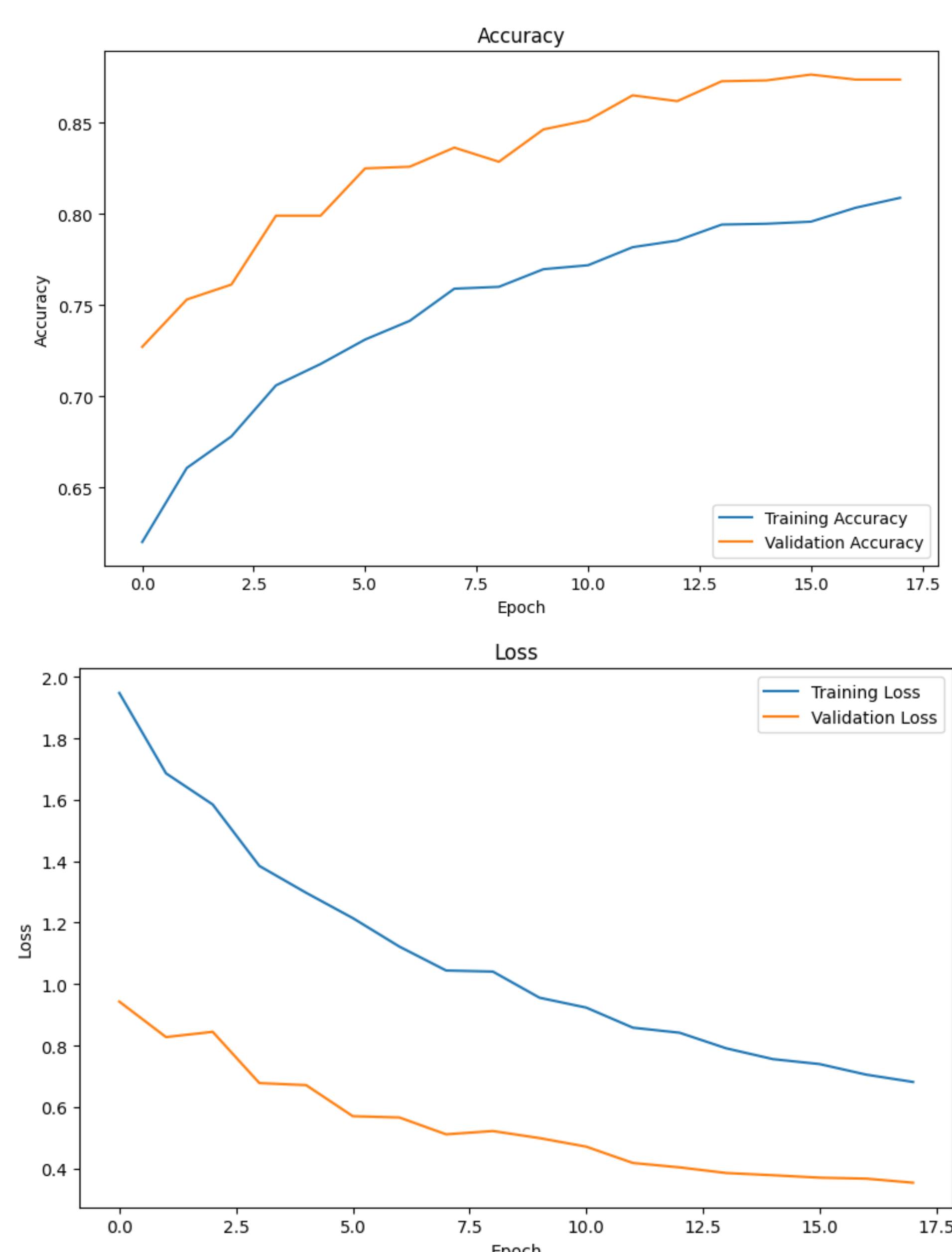


Fig. 2.2: Training Accuracy and Loss Graph



Image 1: Kuihs identifiable through our model (from left, first row: kuih talam, kuih ketayap, onde-onde, kuih lapis; second row, from left: kuih seri muka, kuih ubi kayu, kek lapis, kuih kaswi pandan)

## CONCLUSION

The model for recognition and classification of types of *kuih* ran on an accuracy of **98%** with a inference time of up to **0.15s** per image. Further finetuning will focus on optimizing the model such as quantization and hyperparameter tuning.

## REFERENCES

- Toh, T. (2022, April 05). The colourful history of Malaysian kuih-muih. Tatler Asia. <https://www.tatlerasia.com/dining/food/my-the-colourful-history-of-kuih>