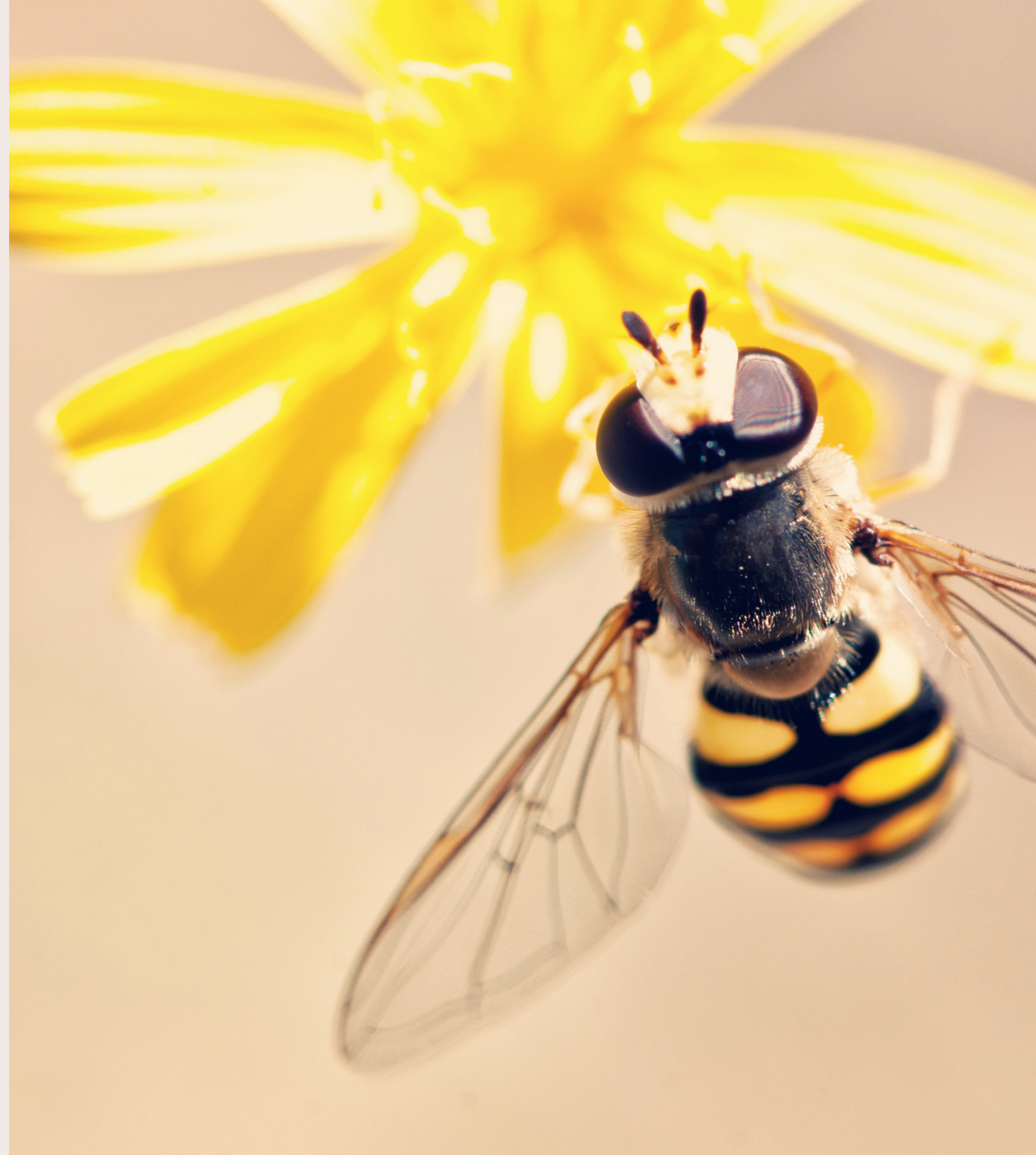


Bee Image Classification using Keras

Evelyn Johnson



Bees are essential: food

1 in 3 bites

Bees are in danger: BCC

1. Parasites
2. Pesticides
3. Infection

01 Varroa Mite



02 Hive Theft



03 Missing Queen



A decorative pattern of light brown hexagons with thin brown outlines, arranged in a honeycomb grid. The pattern is partially visible on the left side of the slide, with some hexagons missing to reveal the solid brown background.

GOAL

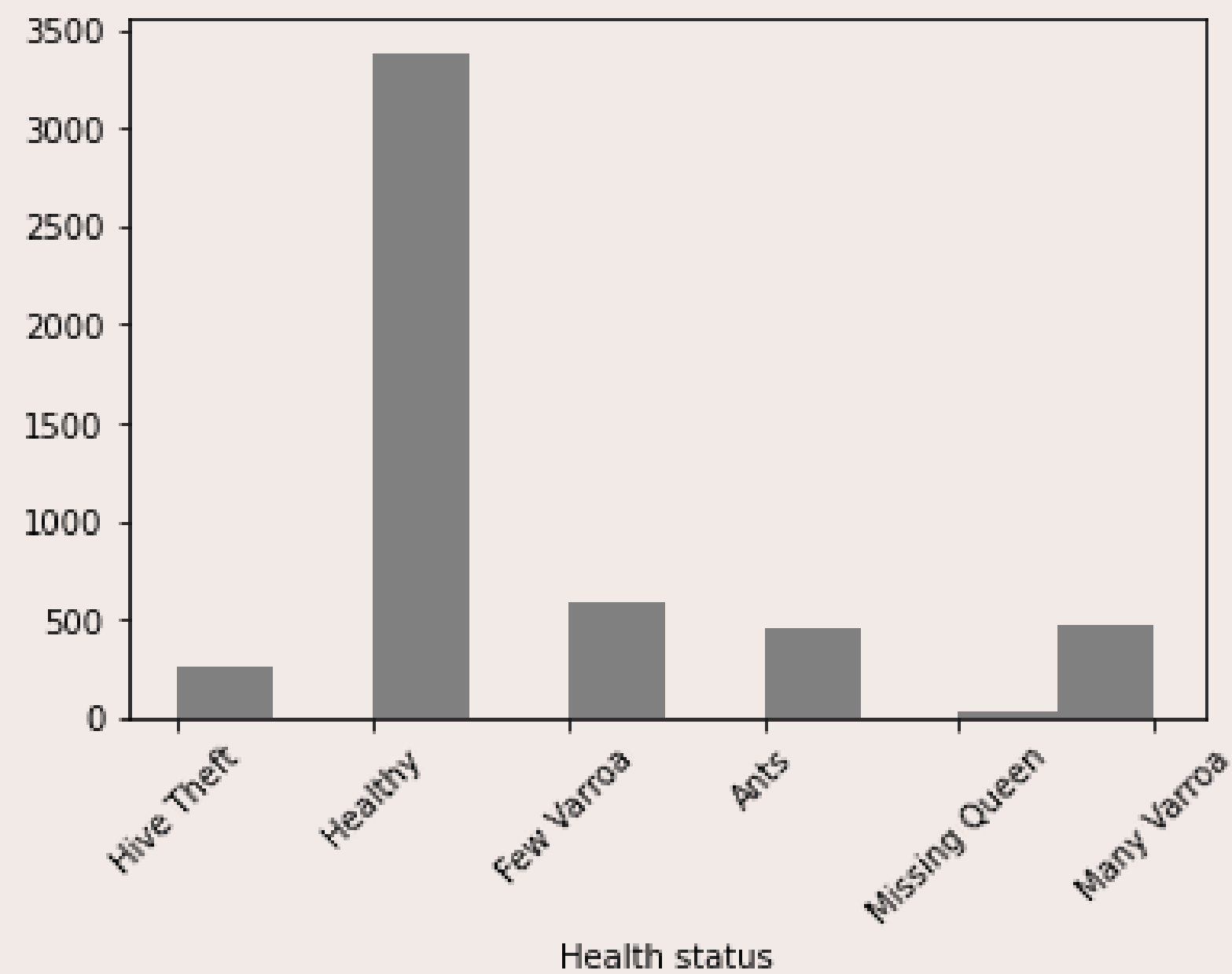
Build a classification model
that can detect the health
status of a hive with one image
of a bee.

DATA



Annotated Bee Images
(n=4136)

Health Condition Categories (n=6)



TOOLS

*Data Acquisition
and Preprocessing*

numpy

pandas

OpenCV

Google Colab

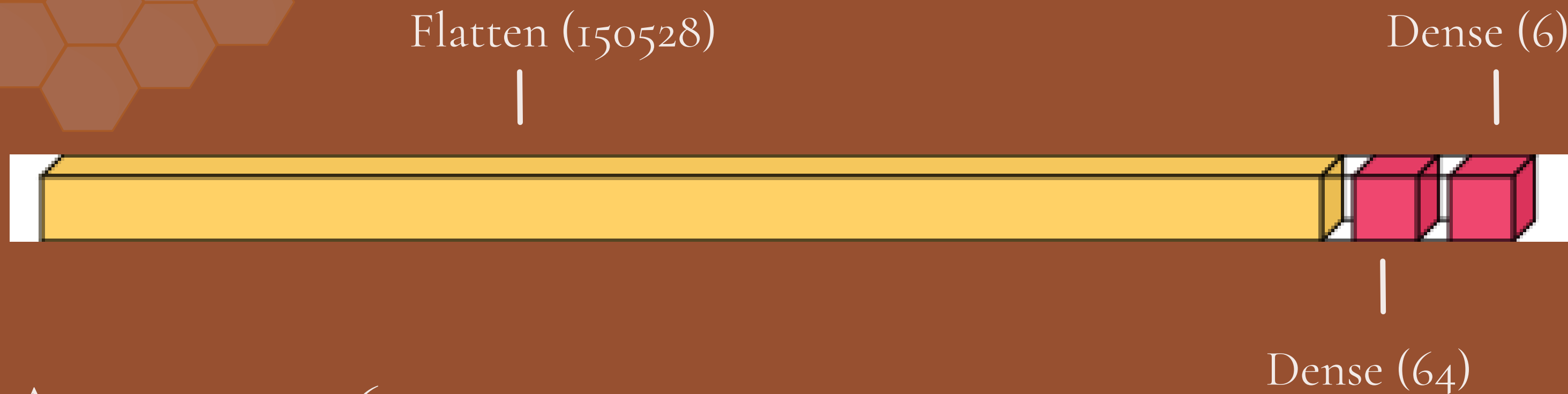
Keras

*Cloud Computing
and Deep
Learning Model*

Visualization

visualkeras

BASILINE MODEL

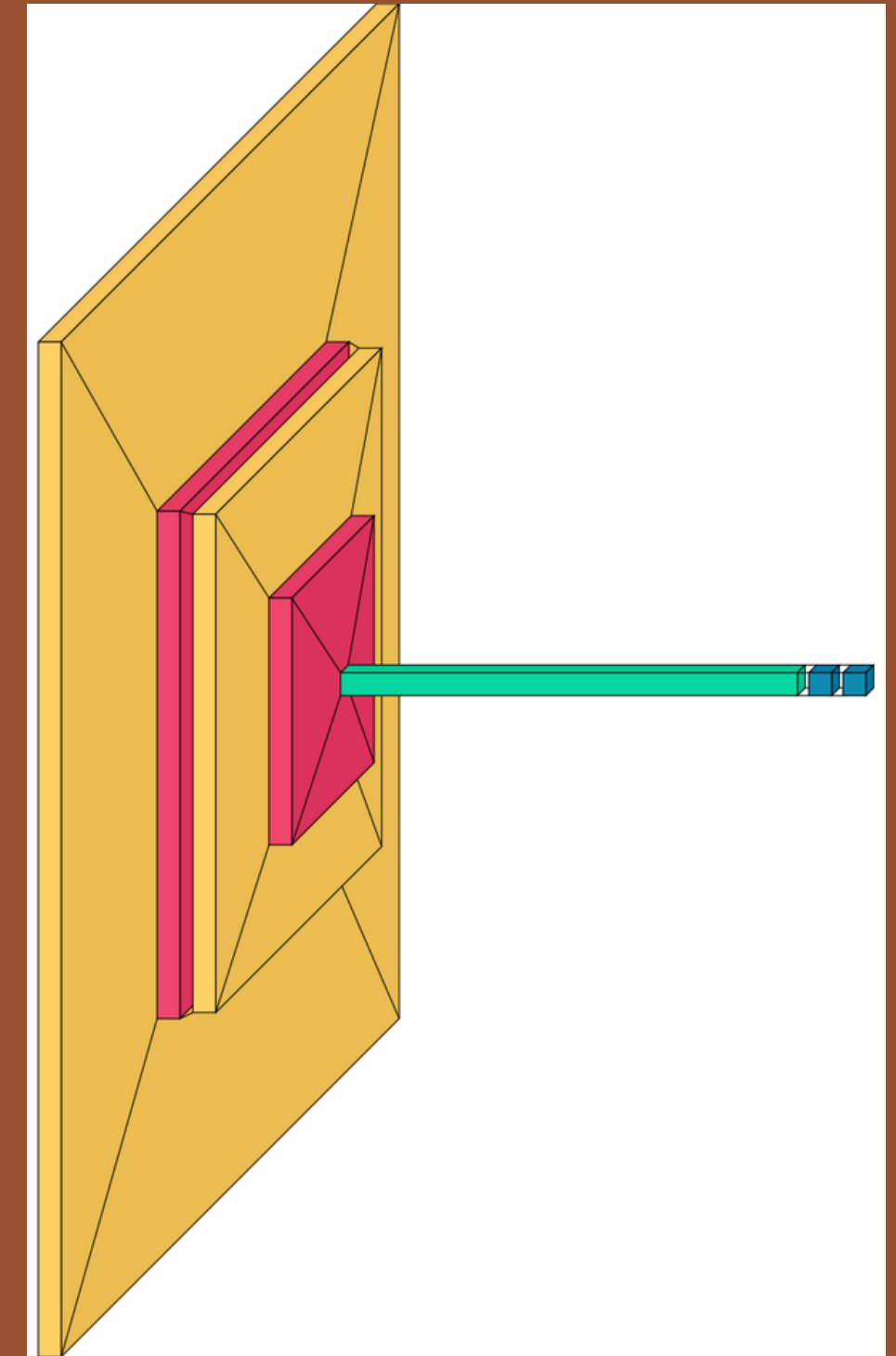
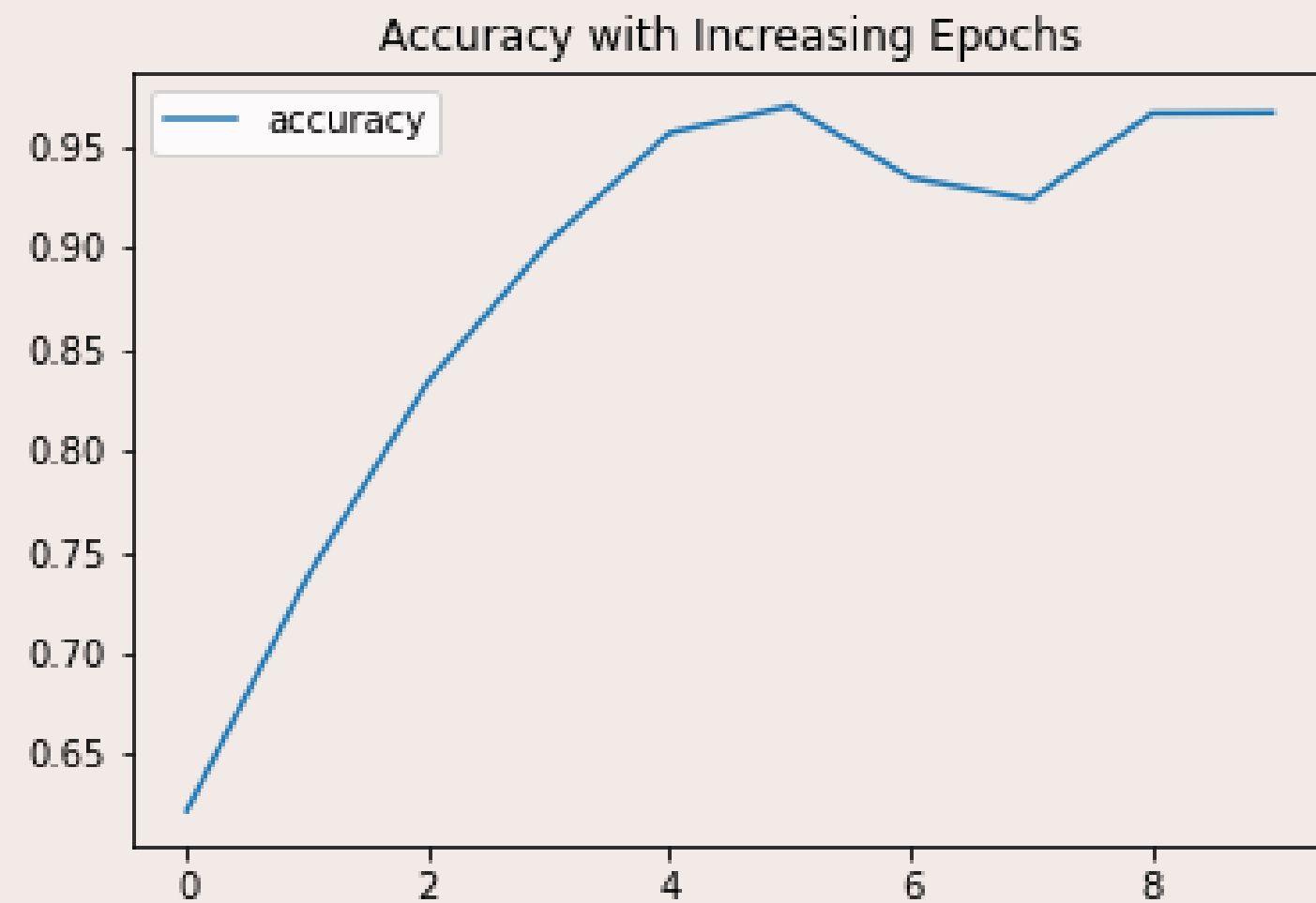


Accuracy: 0.65
F1: 0.52

CNN MODEL

Accuracy: 0.73

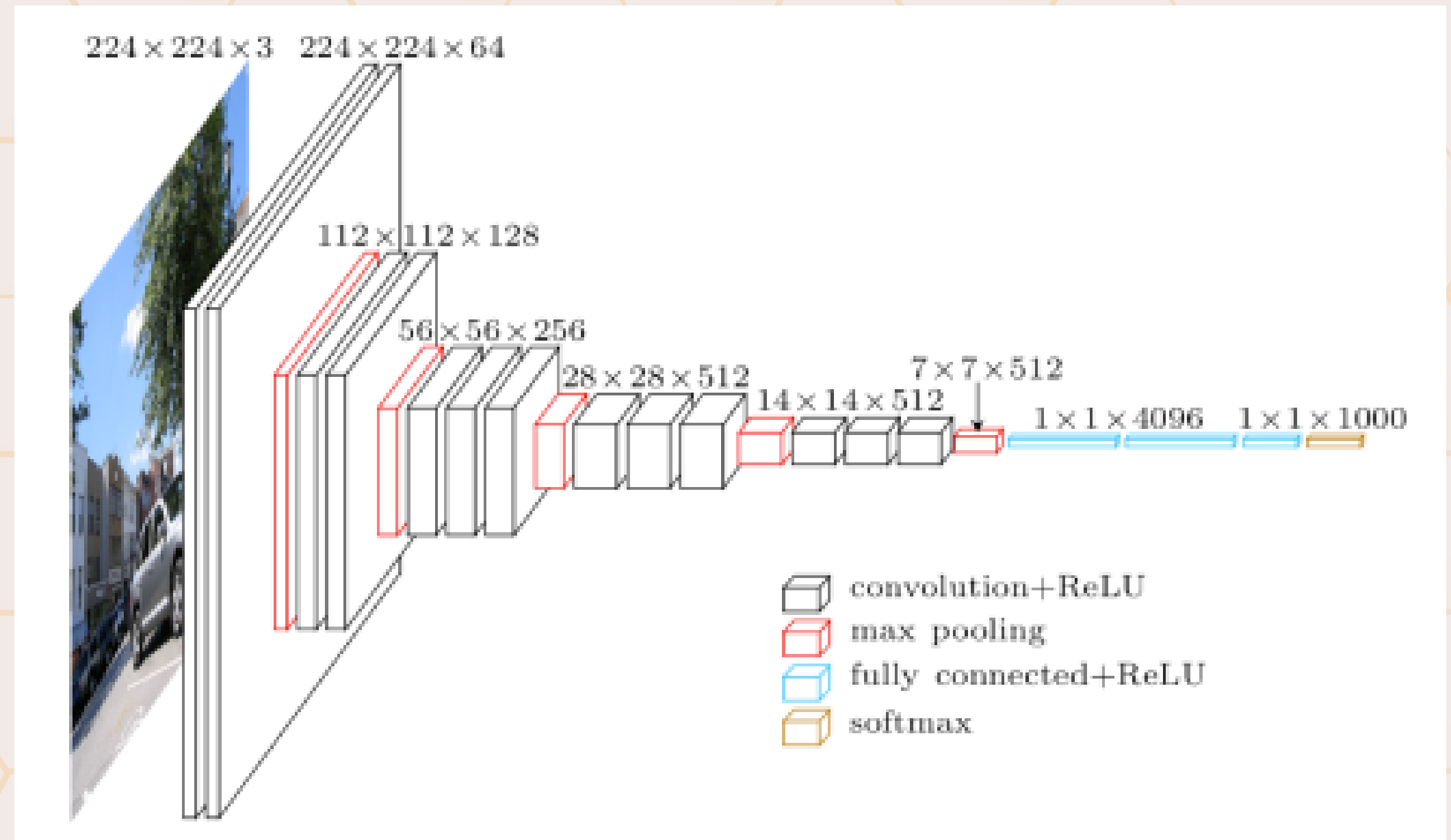
F1: 0.71



VGG₁₆ Weighted with Imagenet

Accuracy: 0.924

F1: 0.9211



Appendix

VGG16 Confusion Matrix

