Bee Image Classification using Keras, CNN

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Bees are essential: food

1 in 3 bites

Bees are in danger: BCC

1. Parasites
2. Pesitcides/Infections
3. Climate Crisis

01 Varroa Mite

02 HiveTheft

03 Missing Queen

GOAL 

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

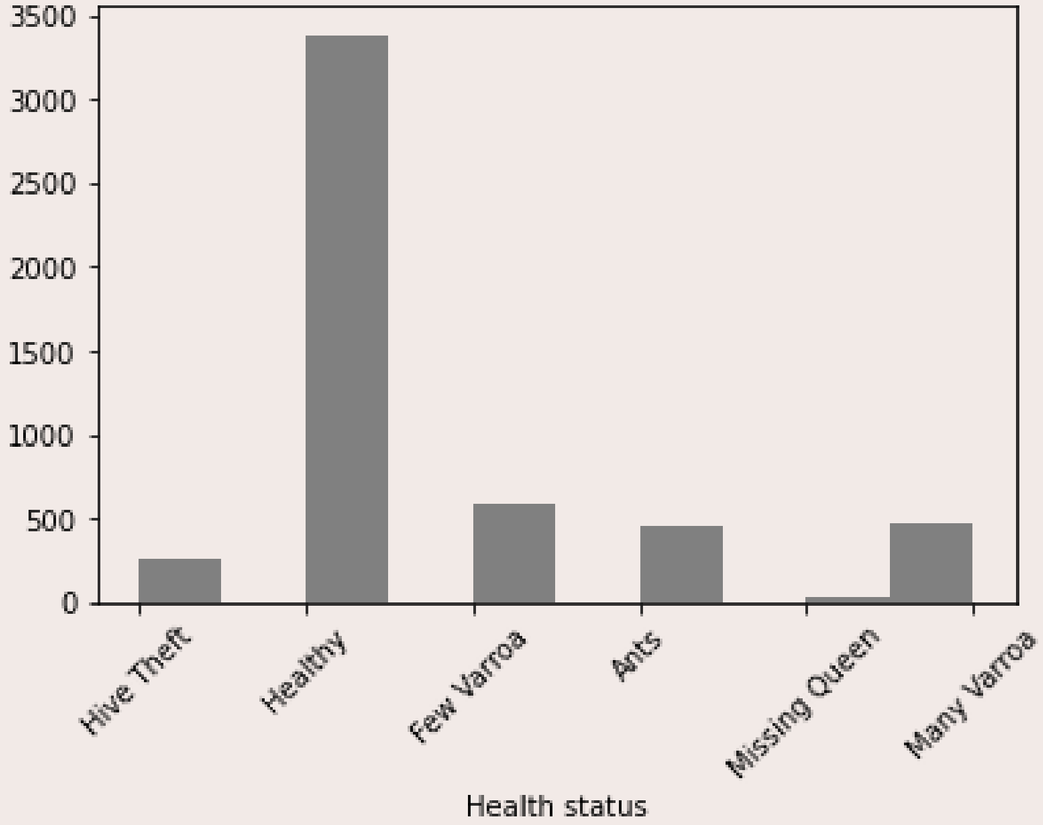
DATA

Class: Healthy

Class: Hive Theft

Annotated Bee Images
(n=4136)

Health Condition Categories (n=6)



TOOLS

numpy

Data Acquisition and Preprocessing

pandas

OpenCV

Keras

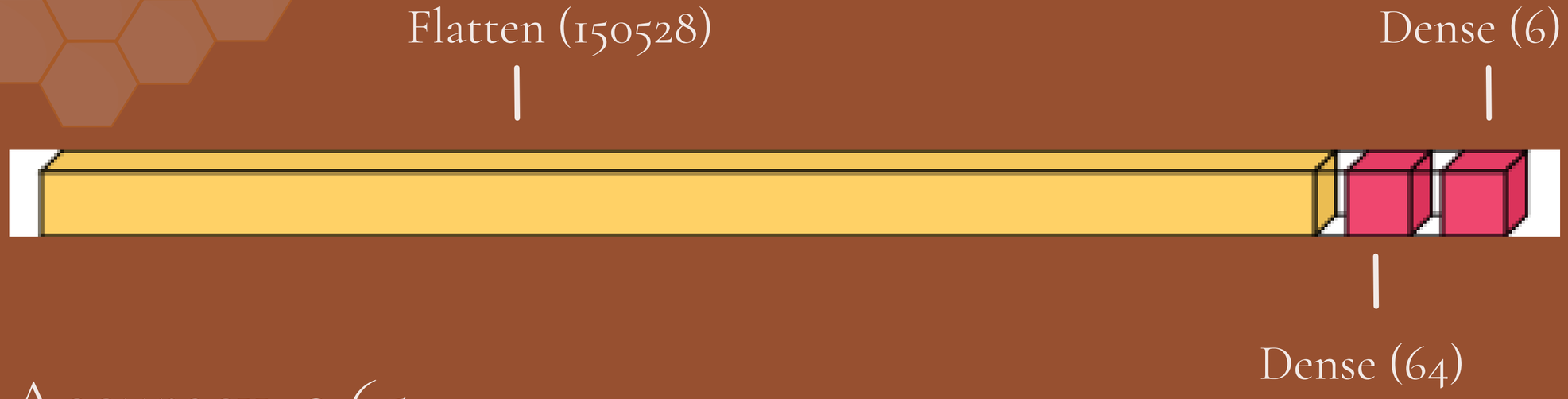
Google Colab

Cloud Computing and Deep Learning Model

Visualization

visualkeras

BASELINE MODEL

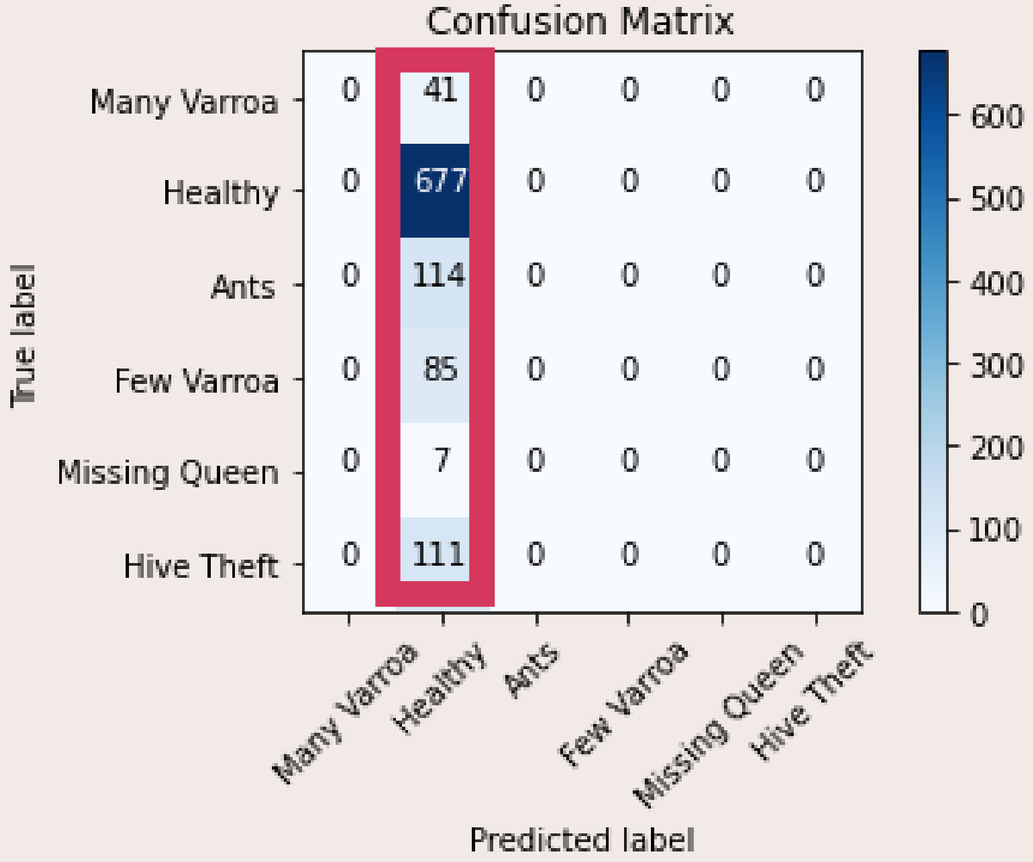


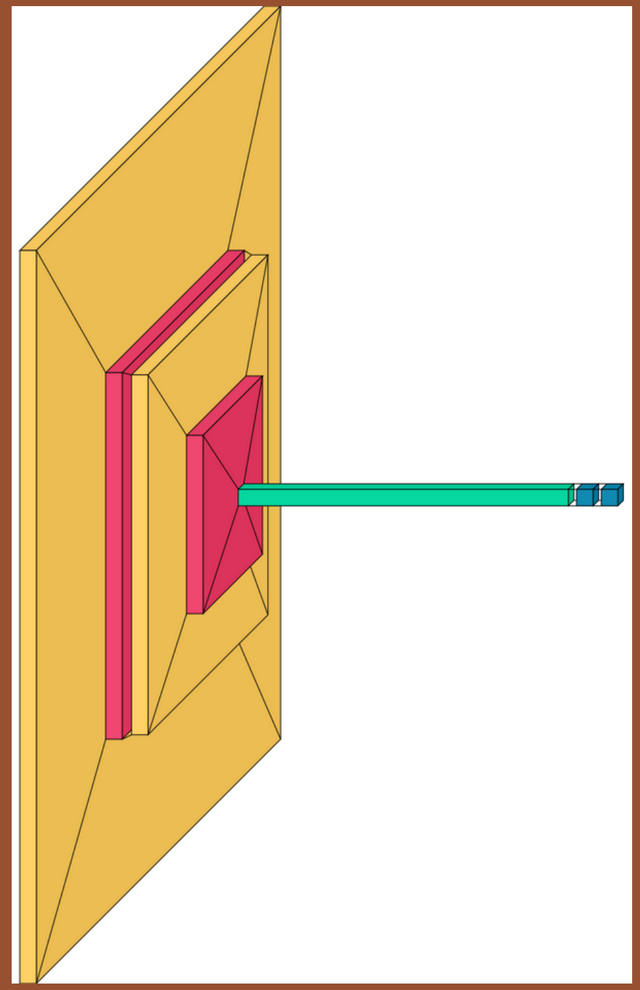
Accuracy: 0.65
F1: 0.52

SIMPLE CNN MODEL

Accuracy: 0.73

F1: 0.71

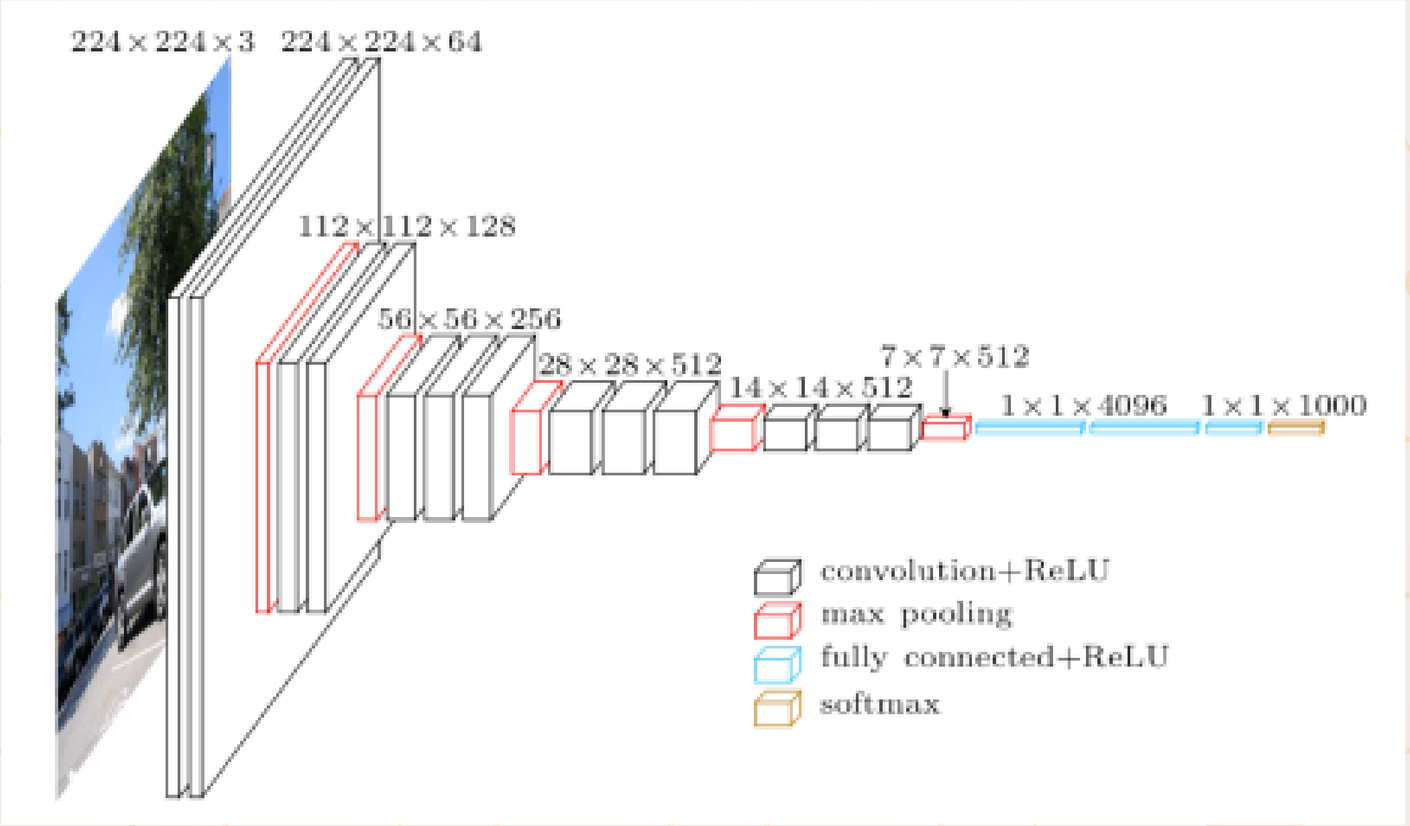




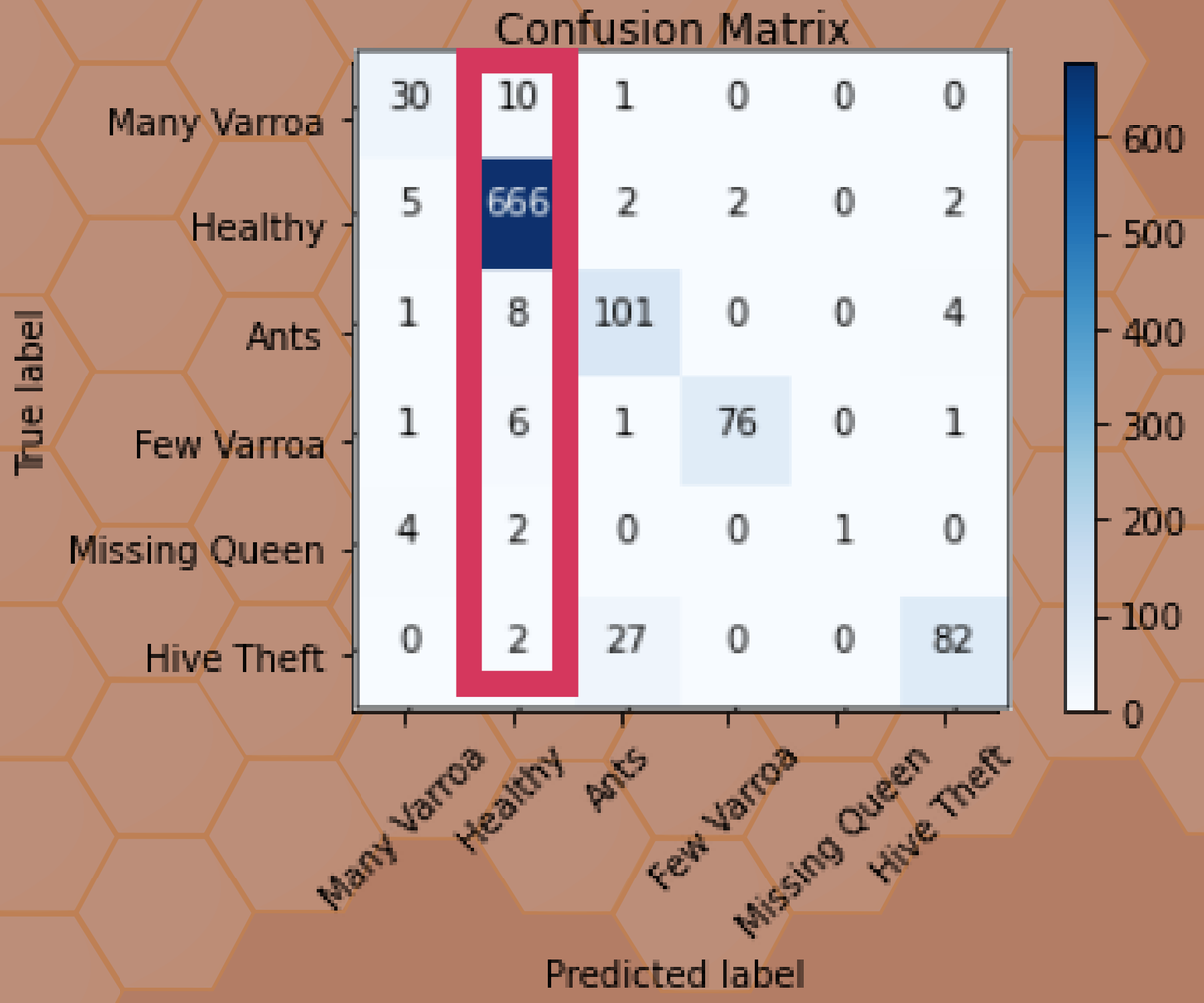
VGG16 Weighted with Imagenet

Accuracy: 0.924

F1: 0.9211



VGG16 Model Confusion Matrix



Future Work

- Continue tuning hyperparameters
- Gather more bee images
- Run with more epochs
- Develop a video classification model (RNN, LSTM) to handle videos of bees

THANK YOU

Appendix

Accuracy for Simple CNN