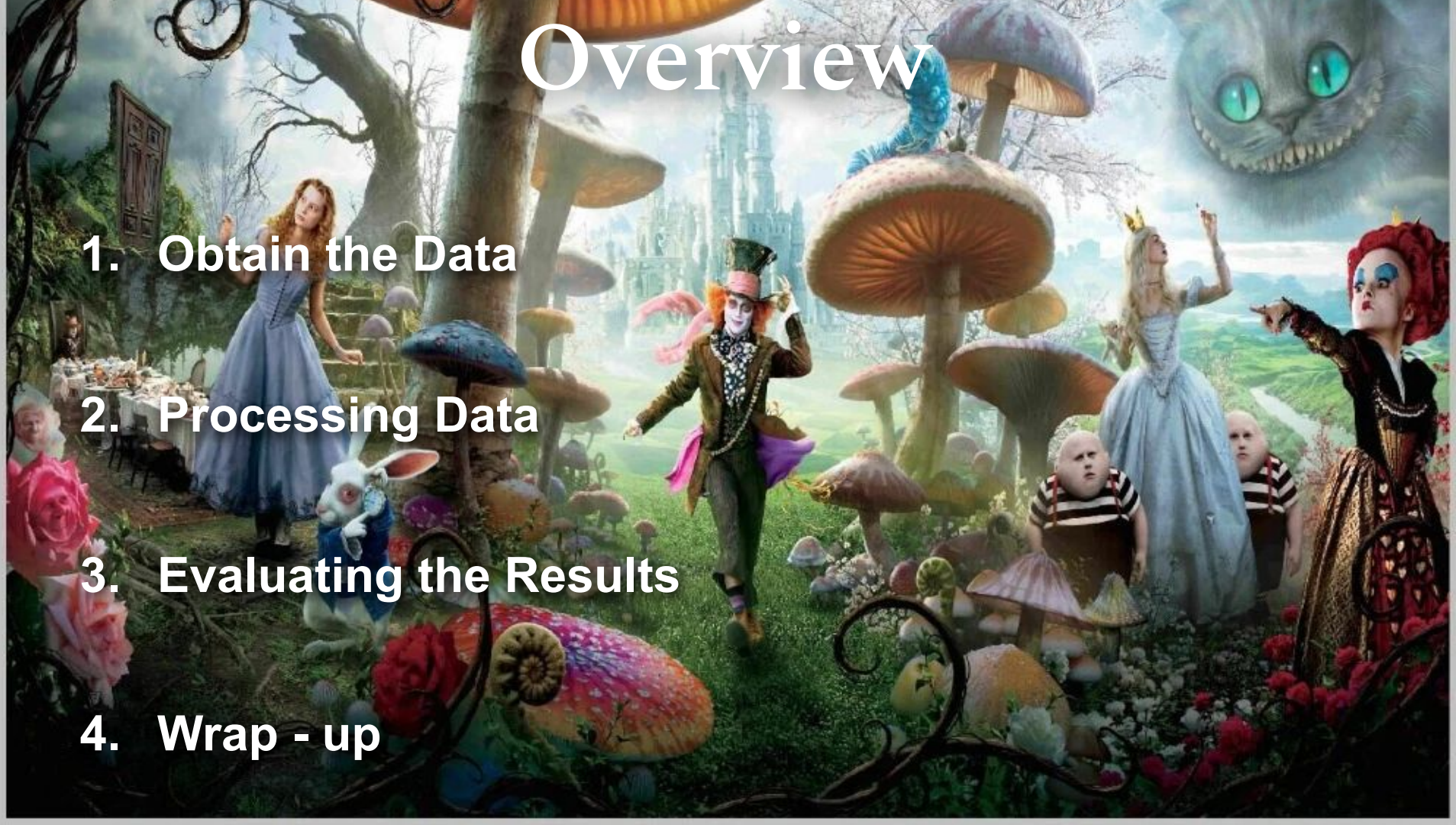
MUSHROOM CLASSIFIERS

Problem Statement

There are over 10,000 known species of mushrooms across the world.

The goal of this project is to train neural networks to classify mushrooms based on their various features.

Overview



1. Obtain the Data
2. Processing Data
3. Evaluating the Results
4. Wrap - up

Obtain the data - identify species:

Mushroom world - https://www.mushroom.world/

Identifying Features

Agaricus arvensis (Horse Mushroom)

Agaricus augustus (The Prince)

Albatrellus confluens

Albatrellus ovinus (Sheep Polypore)

Amanita ceciliae (Snakeskin Grisette)

Amanita fulva (Tawny grisette)

Amanita muscaria (Fly Amanita)

Amanita pantherina (Panther Amanita)

Amanita phalloides (Death Cap Amanita)

Amanita porphyria (Grey veiled amanita)

Amanita regalis (Royal Fly Agaric)

Amanita rubescens (Blushing Amanita)

Species - Amanita Virosa

Edibility - Lethally Poisonous

Amanita virosa (Destroying angel)

Family	**Pluteaceae**
Location	**North America, Europe**
Dimensions	**Cap 5-9 cm diameter, stem 13-20 cm tall * 1.5-2 cm diameter**
Edibility	**Lethally poisonous**

Convolutional Neural Networks

1. Convert image data to numeric arrays based off of color data stored in a file
2. Construct a Sequential Neural Network
    2.1. Multiple Convolutional Layers
    2.2. Flattened into an Array
    2.3. Feed into a Dense Neural Network
3. Compile the layers
4. Fit the model with Training Data

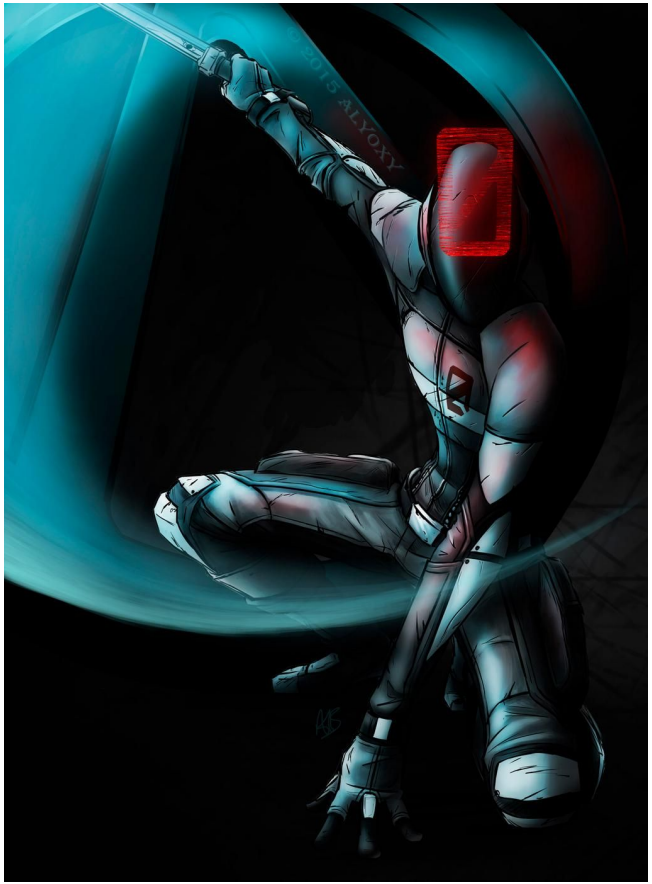
Evaluate - Species

137 separate classes

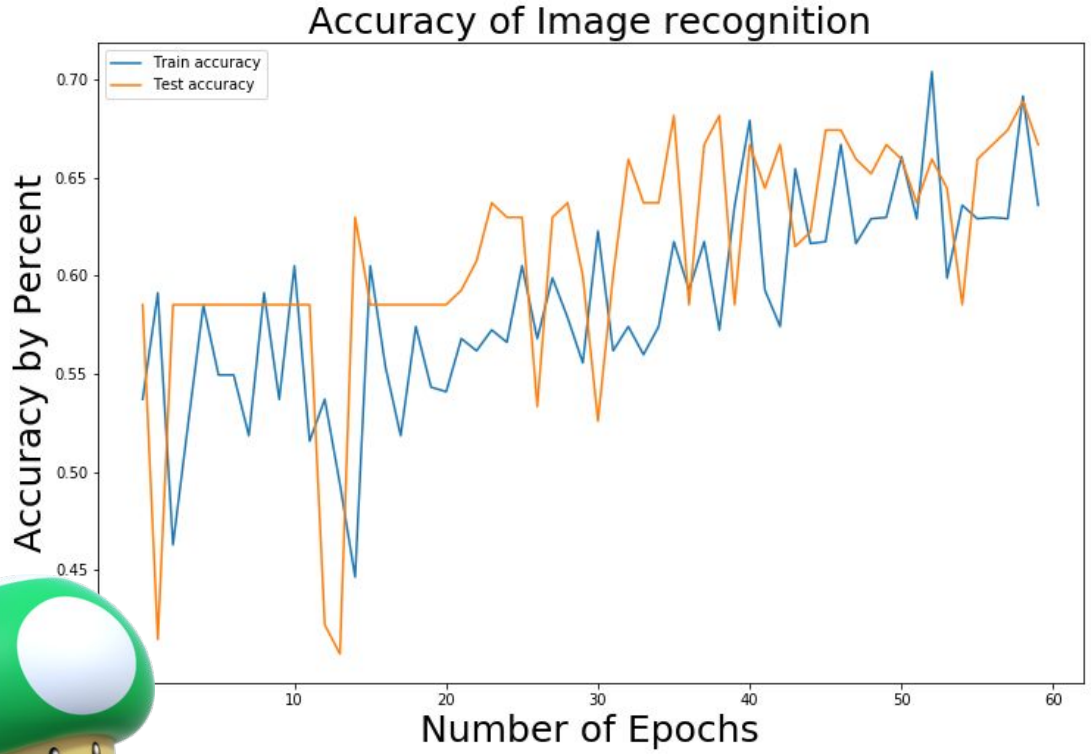
Approximately 5 pictures per species

Zero accurate predictions

2% Accuracy rating



Evaluate - Edibility



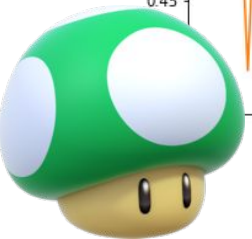
2 Classes

Approximately 200 images of each class

66% Accurate predictions

20% False Negatives

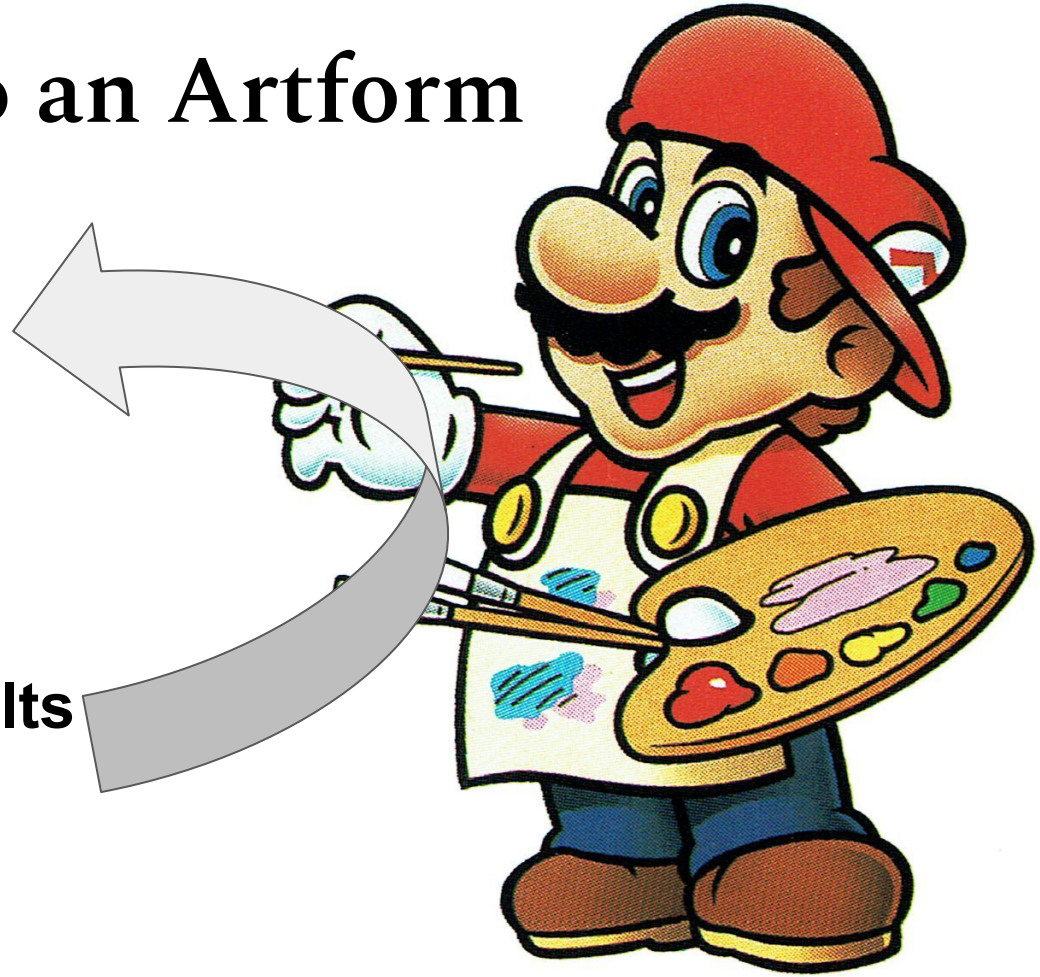
60% ROC AUC



Evaluate - Edibility

Science: It's also an Artform

1. **Obtain the Data**
2. **Processing Data**
3. **Evaluating the Results**
4. **Wrap - up**



Morels

Morchella elata (Black Morel) -

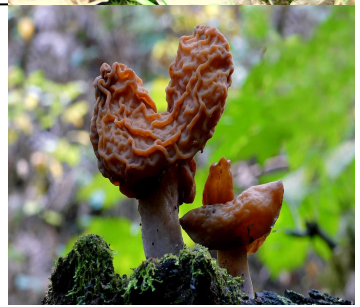
The Good - Edible

Gyromitra esculenta (False Morel)

The Bad - Poisonous

Gyromitra infula (Hooded false morel)

The Ugly - Poisonous



Morels - Data Gathering

Image Downloader

Offered by: Vlad Sabev

	Training	Holdout
Good Morels	883	292
Bad Morels	859	326

Morels - Results

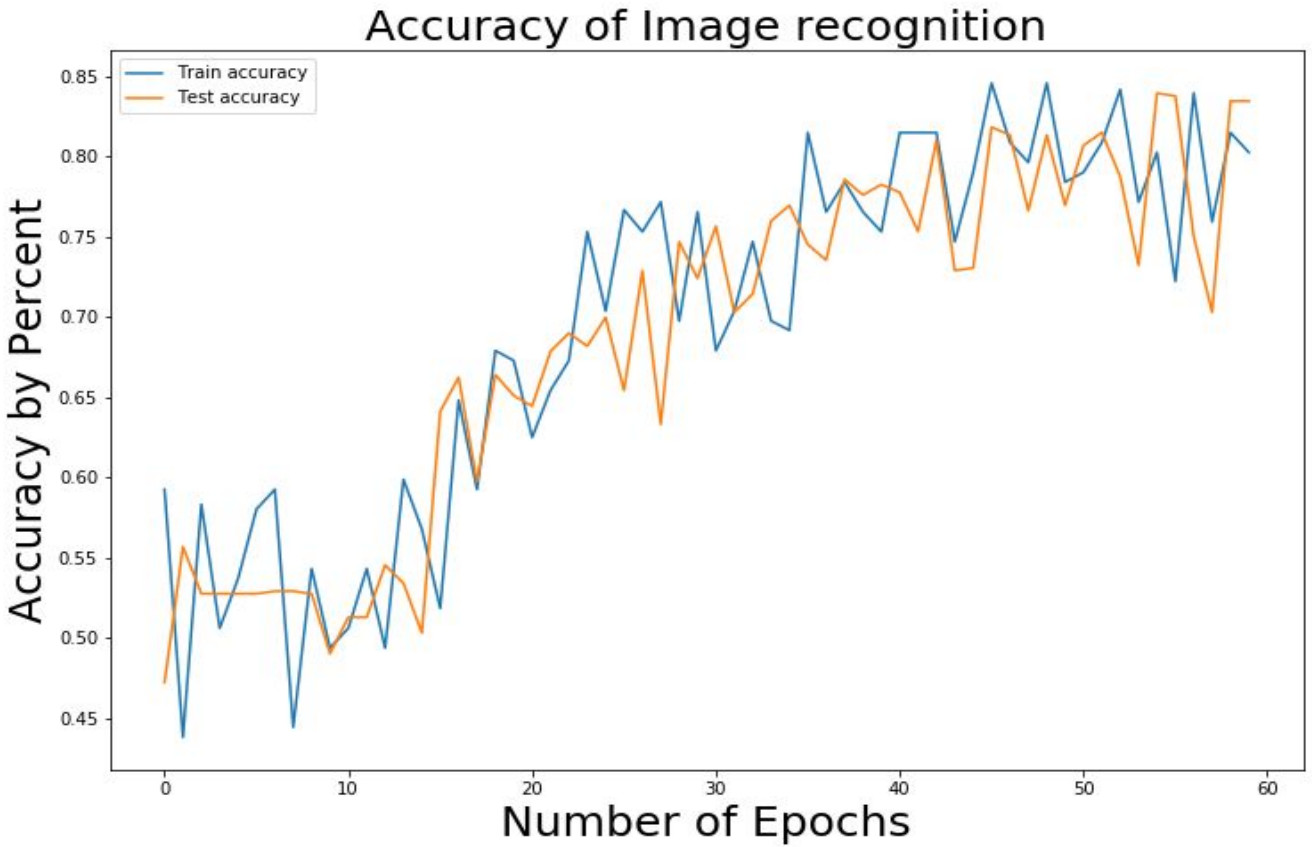
2 Classes

Approximately 850 images of each class

80% Accurate predictions

10% False Negatives

ROC AUC 85%



Conclusion

Any which way you can get a larger amount of relevant data is going to be greatly beneficial

The accuracy result increases going from 5 images per class, to 300 per class, to 1000 per class shows how much having enough of the proper data is probably the most important aspect of making accurate predictions on future data.

Questions?