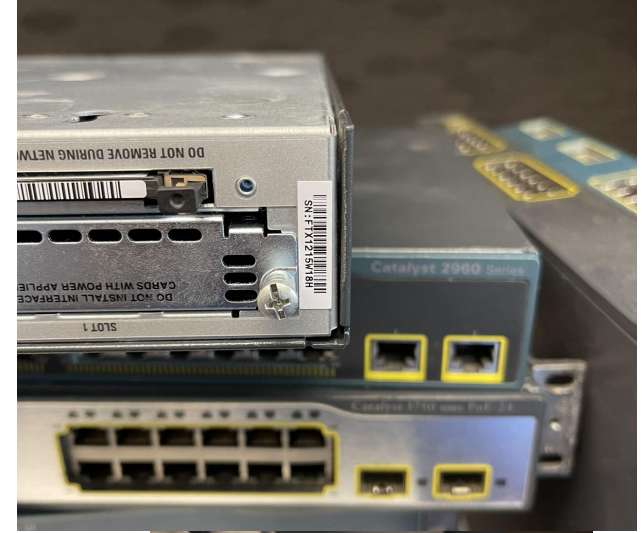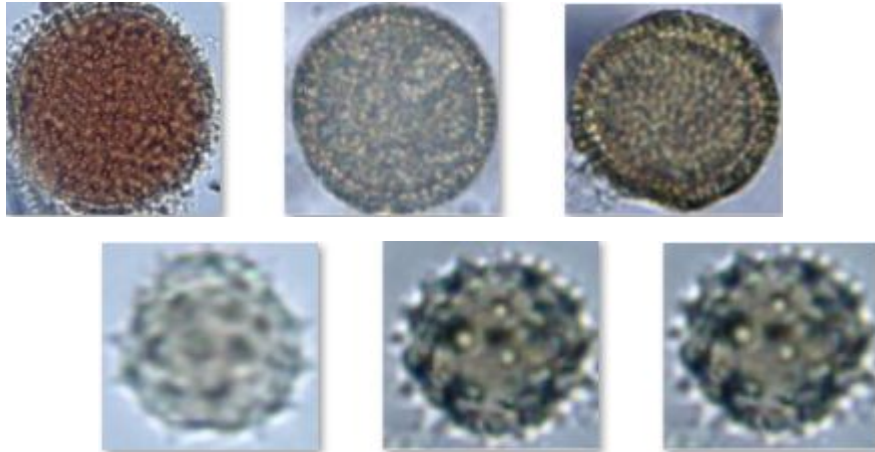# Pollen grain classification

Canyu Hankins
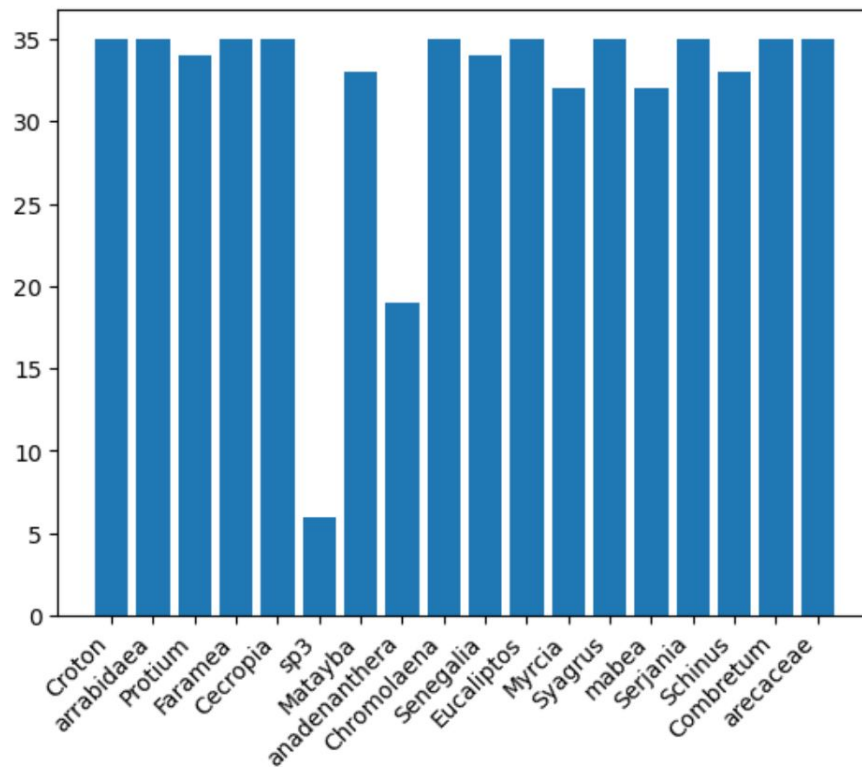
Introduction

- Using machine learning to do image classification on daily task
- Hardware inventory database
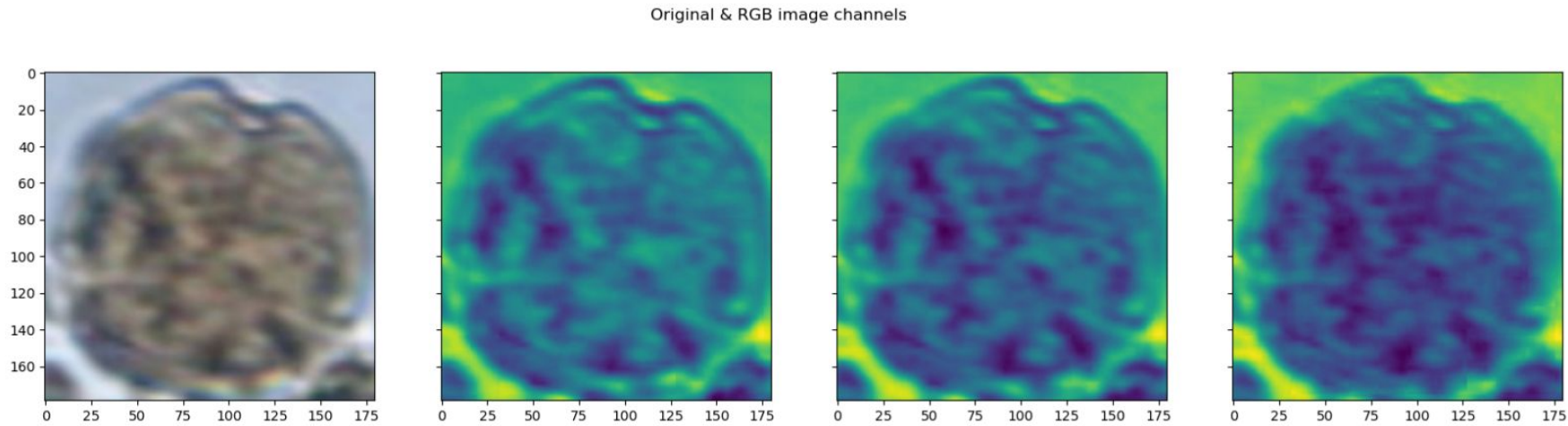- Image classification on pollen

Dataset

- Pollen dataset
- 18 classes:
  - Croton, arrabidaea…
- ~18 MB
- 573 images
- Somewhat unbalanced

Data preprocessing/Data Augmentation

Original & RGB image channels

- Unbalanced database
  - May cause low accuracy
- Create more image to fill in the gap
- Different size
- Color

Models

- Basic sequential model
- 3 layers convolutional network + 1 output layer
- 5 epoch
- ~6% accuracy
- Playing around different feature
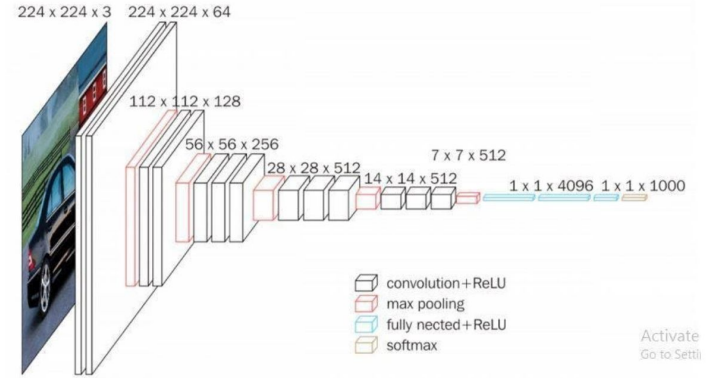- Fluctuated accuracy while training the model

Potential Problems

- Overfitting
- Unbalanced dataset
- Small dataset

- Early stopping
- Data augmentation - create more image
    - Rotation
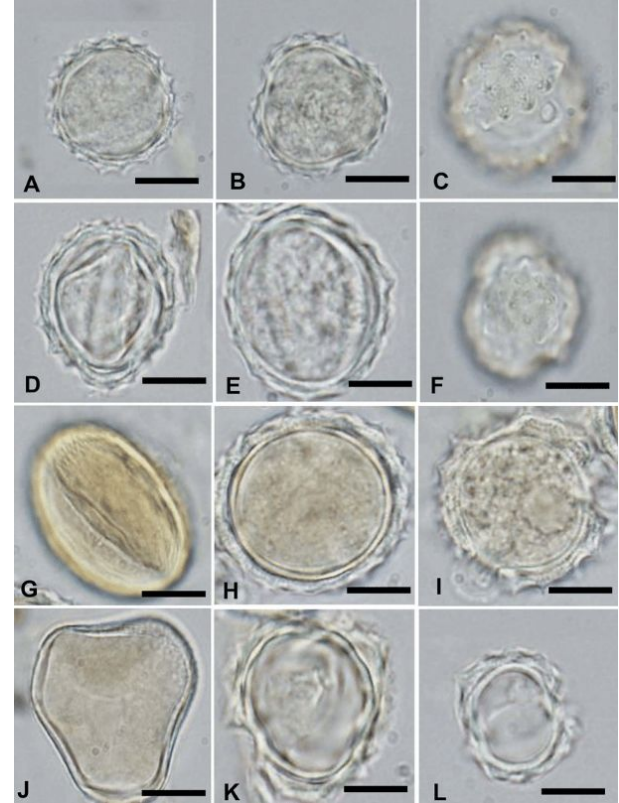   - Reflection
    - Brightness etc.

VGG 16

- One of the most popular model for image recognition
- 16 layers
  - 13 layers CNN + 3 dense layer
- 3 epoch
- Accuracy: increase to about 72% of accuracy
- Increase to 10 epoch
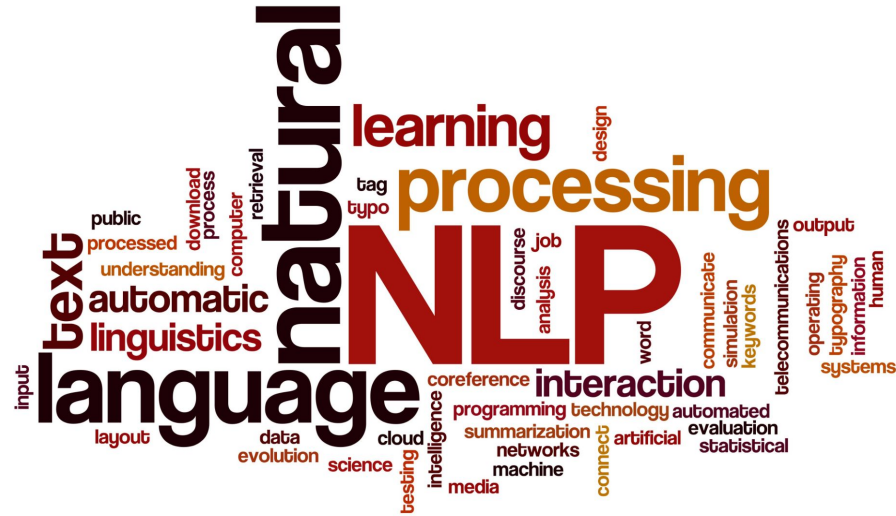- Accuracy increase to ~88%

Future Work

- More data
- Used other CNN models
- Creating database based off the result
- Work on similar project
  - Hardware inventory database

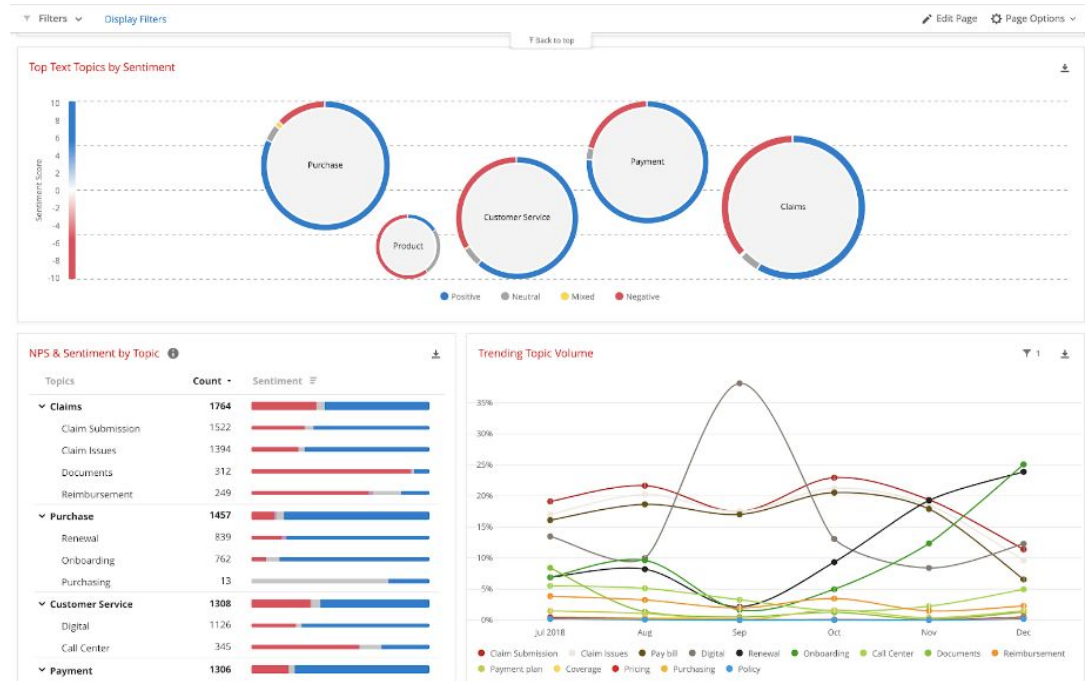# What is Text Mining (Text Analytics)?

What is Text Mining (Text Analytics)?

- Text mining is an AI technology that uses natural language processing (NLP) to transform the unstructured text in documents and databases into normalized, structured data suitable for analysis or to drive machine learning algorithms.
- Getting useful information based off plain text.

Application

- Sentimental analysis
- Sales and marketing
- Customer Care Service
- Risk management
- Fraud detection
- Business intelligence
- Examples:
  - ChatGPT
  - Survey evaluation
  - Price estimation
  - more

Reference

- https://www.ibm.com/topics/text-mining
- https://www.linguamatics.com/what-text-mining-text-analytics-and-natural-language-processing
- https://github.com/JBall1/CNN-Limited-Dataset/blob/master/imageGen.py
- https://medium.com/@mygreatlearning/everything-you-need-to-know-about-vgg16-7315defb5918