**Stage 1: Preliminary Research and Working with Existing Models**

**Henry Roeth**

**GitHub Repository:** [**https://github.com/henryroeth/cpsc386-cv-project**](https://github.com/henryroeth/cpsc386-cv-project)

**What is Image Classification?**

Using computer vision and machine learning algorithms to extract meaning from an image.

**Key Concepts**

* **Dataset:** A collection of labeled images used to train the model.
* **Semantic Gap:** The difference between how humans see an image and how computers process it.
* **Factors of Variation:** Changes in images such as viewpoint, lighting, and size that affect classification.

**Types of Learning**

1. **Supervised Learning:** Uses labeled images to train a model. If the model makes a mistake, we correct it until it learns properly.
2. **Unsupervised Learning:** Finds patterns in images without labels. This method is useful when labeling data is too expensive or time-consuming.
3. **Semi-Supervised Learning:** Uses a small amount of labeled data and a large amount of unlabeled data to improve learning.

**Code Implementation**

**A screen shot of a computer program

AI-generated content may be incorrect.**

A cat with green eyes

AI-generated content may be incorrect.A black dog running in the grass

AI-generated content may be incorrect.A black dog running in grass

AI-generated content may be incorrect.**Results**

A cat with green eyes

AI-generated content may be incorrect.

**References**

1. **Image classification basics:** [**https://pyimagesearch.com/2021/04/17/image-classification-basics/#:~:text=Image%20classification%2C%20at%20its%20very,predefined%20set%20of%20possible%20categories**](https://pyimagesearch.com/2021/04/17/image-classification-basics/#:~:text=Image%20classification%2C%20at%20its%20very,predefined%20set%20of%20possible%20categories)
2. **Ultralytics code documentation (classification):** [**https://www.ultralytics.com/blog/how-to-use-ultralytics-yolo11-for-image-classification**](https://www.ultralytics.com/blog/how-to-use-ultralytics-yolo11-for-image-classification)
3. **Ultralytics code documentation (detection):** [**https://www.ultralytics.com/blog/how-to-use-ultralytics-yolo11-for-obb-object-detection**](https://www.ultralytics.com/blog/how-to-use-ultralytics-yolo11-for-obb-object-detection)