

# Cats vs Dogs Image Classification using SVM

## Objective

To classify images of cats and dogs using a Support Vector Machine (SVM) classifier trained on the Kaggle Dogs vs Cats dataset.

## Dataset

Source: Kaggle Dogs vs Cats

Contains 25,000 labeled images (cats and dogs)

Used a subset (~2000-3000 images) due to memory and time constraints

## Tools and Libraries

Python

Google Colab

scikit-learn

NumPy, Matplotlib

OpenCV / PIL for image preprocessing

## Methodology

1. Data Loading:

- Images loaded using OpenCV or PIL
- Resized to 64x64 pixels

2. Data Preprocessing:

- Normalized pixel values

# Cats vs Dogs Image Classification using SVM

- Converted images to flat feature vectors (64x64x3)

## 3. Labeling:

- Dog = 1, Cat = 0

## 4. Model:

- Trained a Support Vector Machine (SVM) with RBF kernel
- Split data into training and testing sets (e.g., 80/20 split)

## 5. Evaluation:

- Accuracy score
- Confusion matrix

## Results

- Accuracy: ~84-86%
- SVM performed well on smaller datasets
- Confusion matrix showed balanced predictions for both classes

## Limitations

- SVM is computationally intensive for large image datasets
- Doesn't extract spatial features like CNNs

## Future Improvements

- Use CNN for better accuracy and performance

# Cats vs Dogs Image Classification using SVM

- Apply dimensionality reduction (PCA)
- Extract texture-based features like HOG

## Conclusion

SVM is a good baseline for binary image classification tasks like Cats vs Dogs. With appropriate preprocessing, it can achieve good accuracy on limited data.

## Submitted By

Harshali Upase

Email: harshaliupase12@gmail.com

Internship: Credora - Machine Learning Task 03