28th Feb

FLOWER RECOGNITION USING CNN

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CONTENT

OUR GROUP MEMBERS

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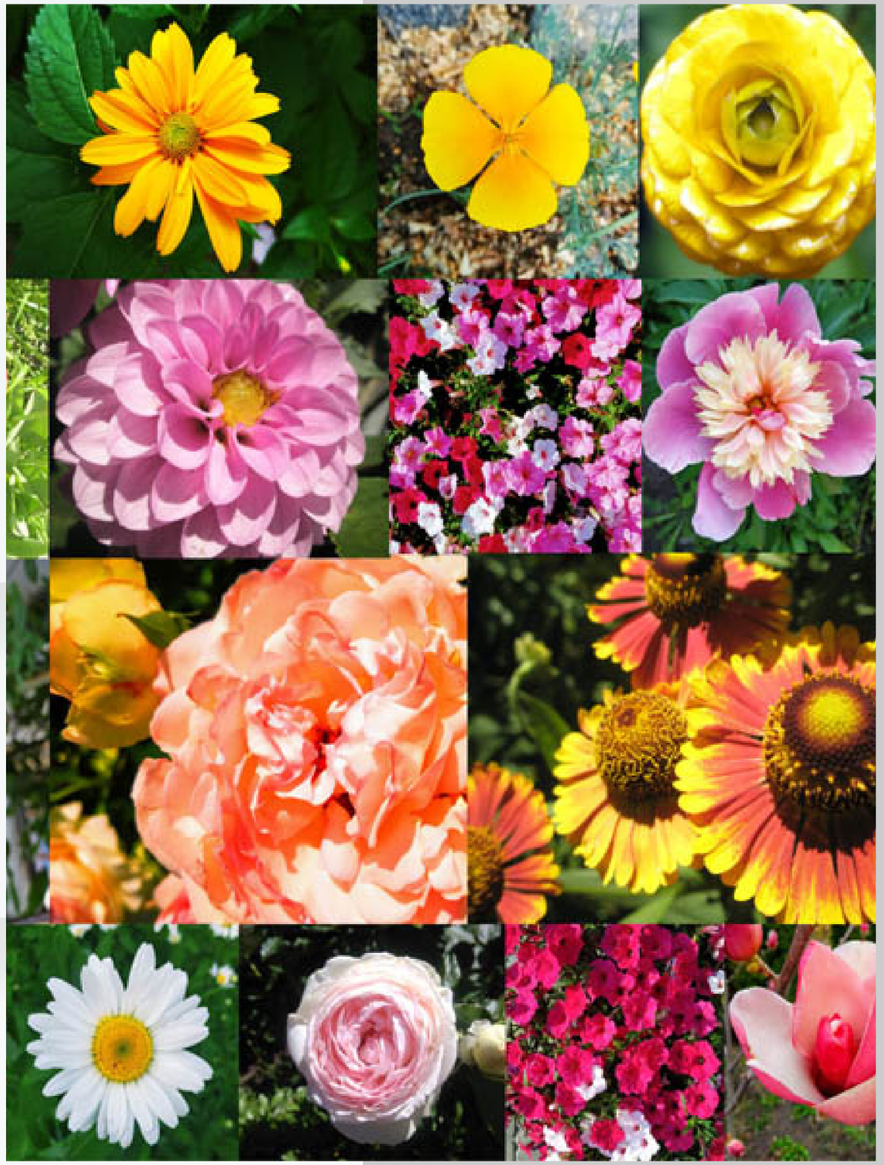
PROBLEM STATEMENT

THE PRIMARY GOAL OF THIS PROJECT IS TO DEVELOP A CONVOLUTIONAL NEURAL NETWORK (CNN) MODEL CAPABLE OF AUTOMATING THE PROCESS OF FLOWER CLASSIFICATION. THIS INVOLVES TRAINING THE MODEL TO ACCURATELY CLASSIFY IMAGES OF FLOWERS INTO PREDEFINED CATEGORIES CORRESPONDING TO DIFFERENT SPECIES OR CLASSES.



PROJECT INTRODUCTION

Botany

Species Identification

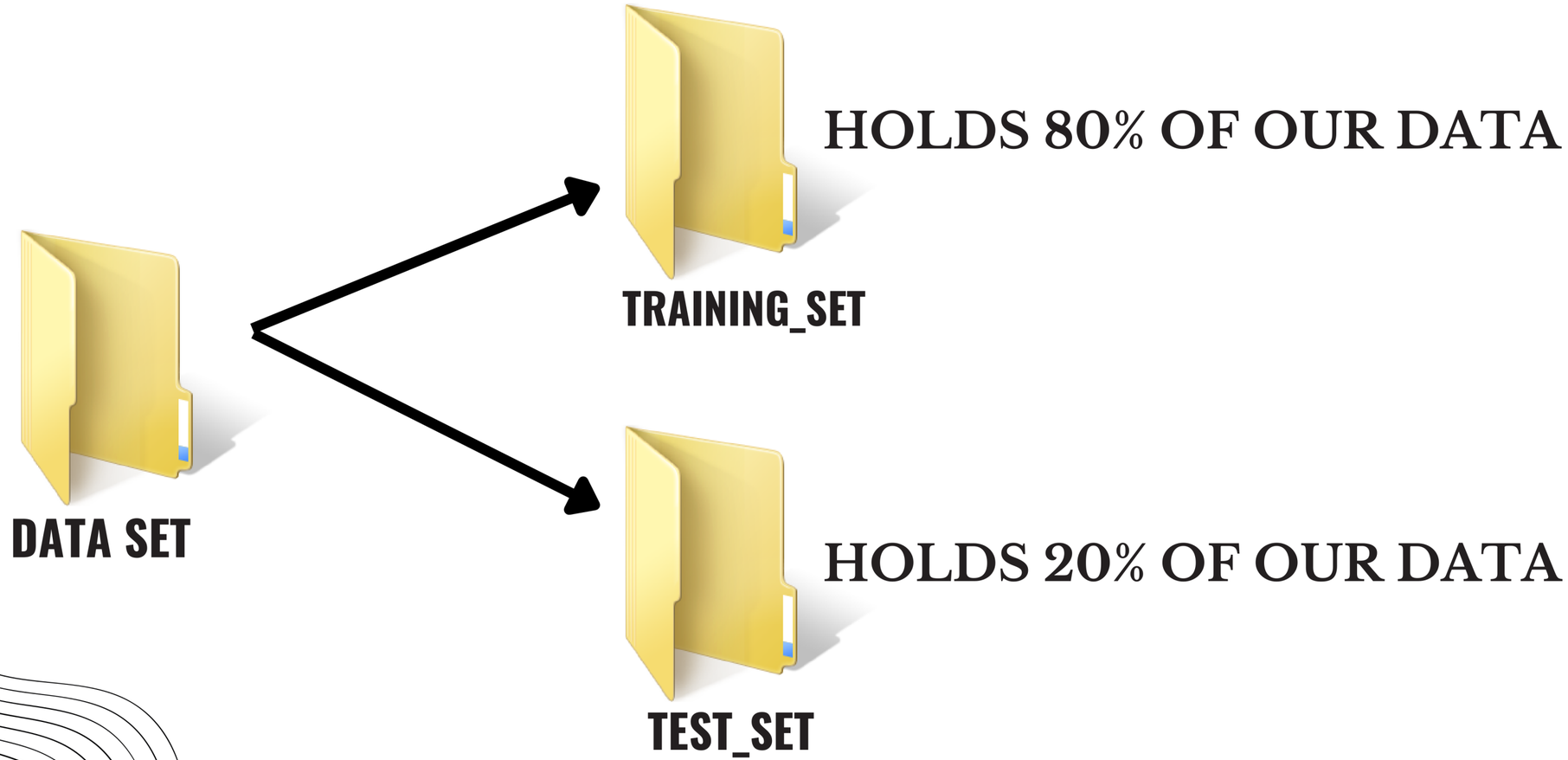
Agriculture

To monitor crop health and growth stages by identifying flowering plants

Environmental monitoring

This project helps keep an eye on nature's well-being by automatically identifying flowers. It helps us understand if ecosystems are healthy, where pollinators live, and if any harmful plants are invading.

DATA COLLECTION



DATA PREPROCESSING

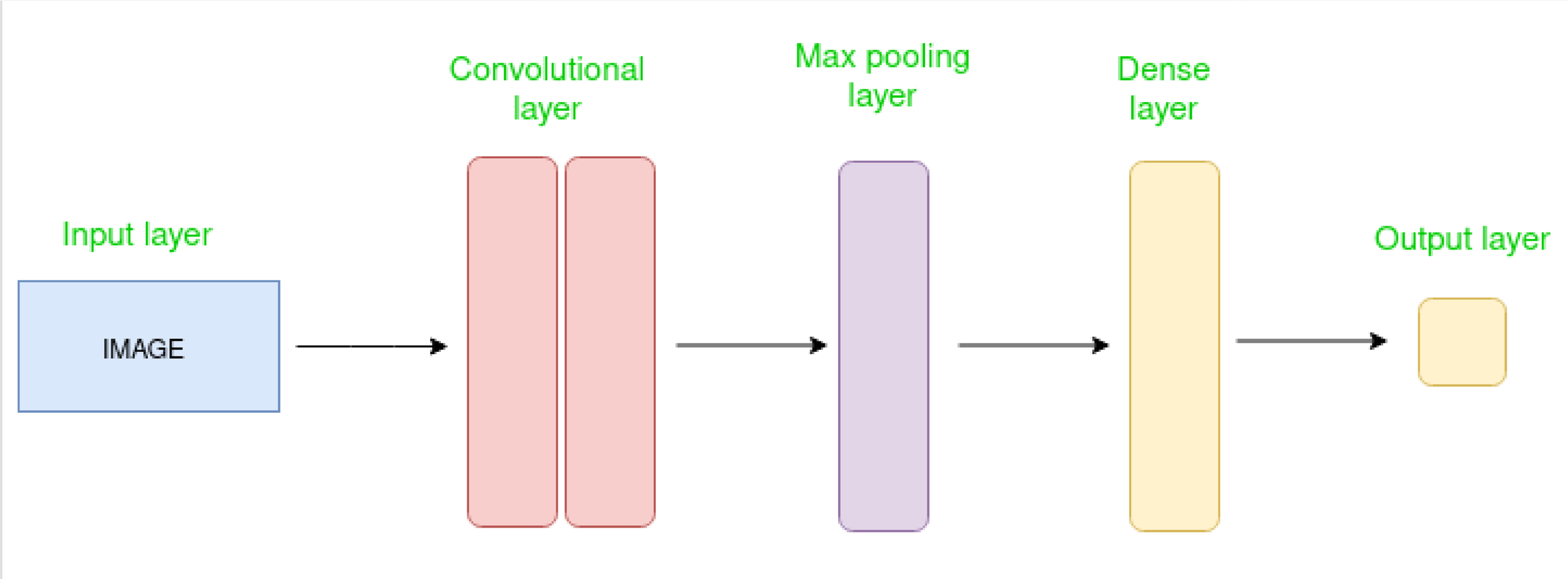
```
# Data Augmentation and Preprocessing
train_datagen = ImageDataGenerator(
        rescale=1./255,
        shear_range=0.2,
        zoom_range=0.2,
        horizontal_flip=True)
training_set = train_datagen.flow_from_directory(
        'training_set',
        target_size=(64, 64),
        batch_size=32,
        class_mode='categorical')

test_datagen = ImageDataGenerator(rescale=1./255)
test_set = test_datagen.flow_from_directory(
        'test_set',
        target_size=(64, 64),
        batch_size=32,
        class_mode='categorical')
```

TECHNIQUES INCLUDE:

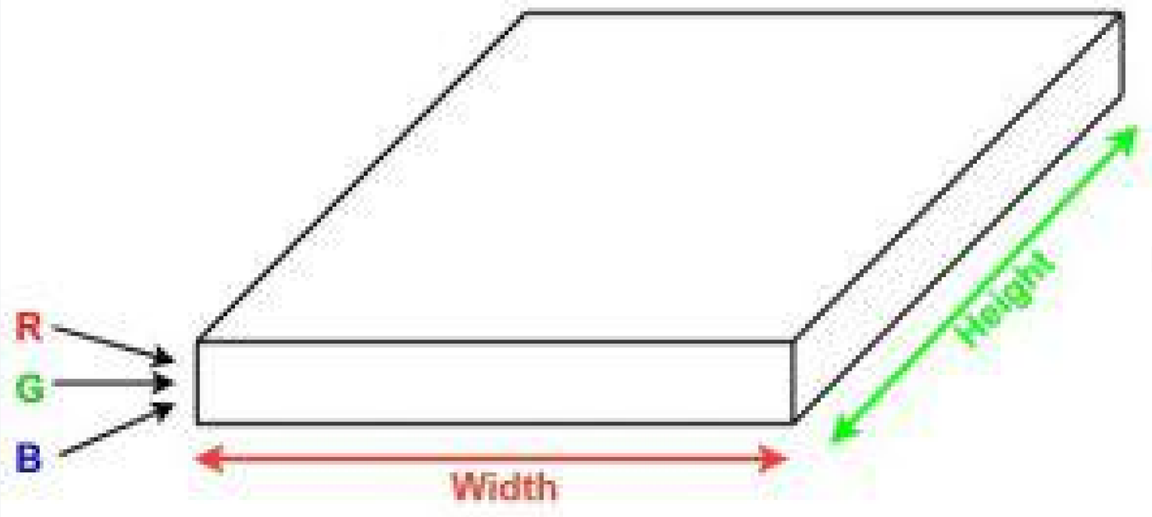
- Random shearing (shear_range=0.2).
- Random zooming (zoom_range=0.2).
- Horizontal flipping (horizontal_flip=True).

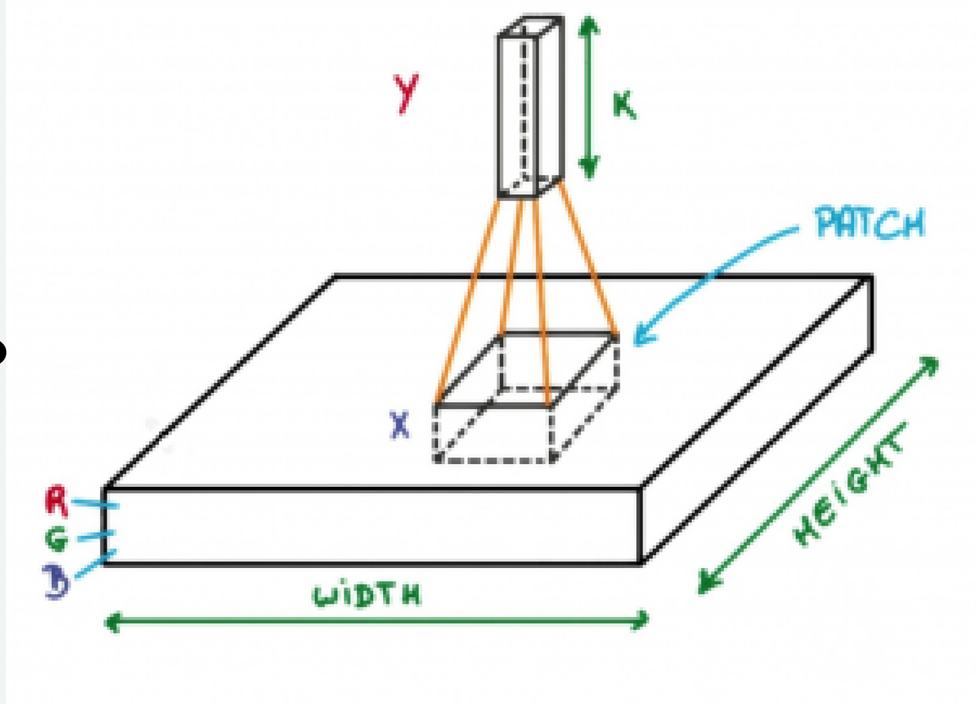
MODEL ARCHITECTURE



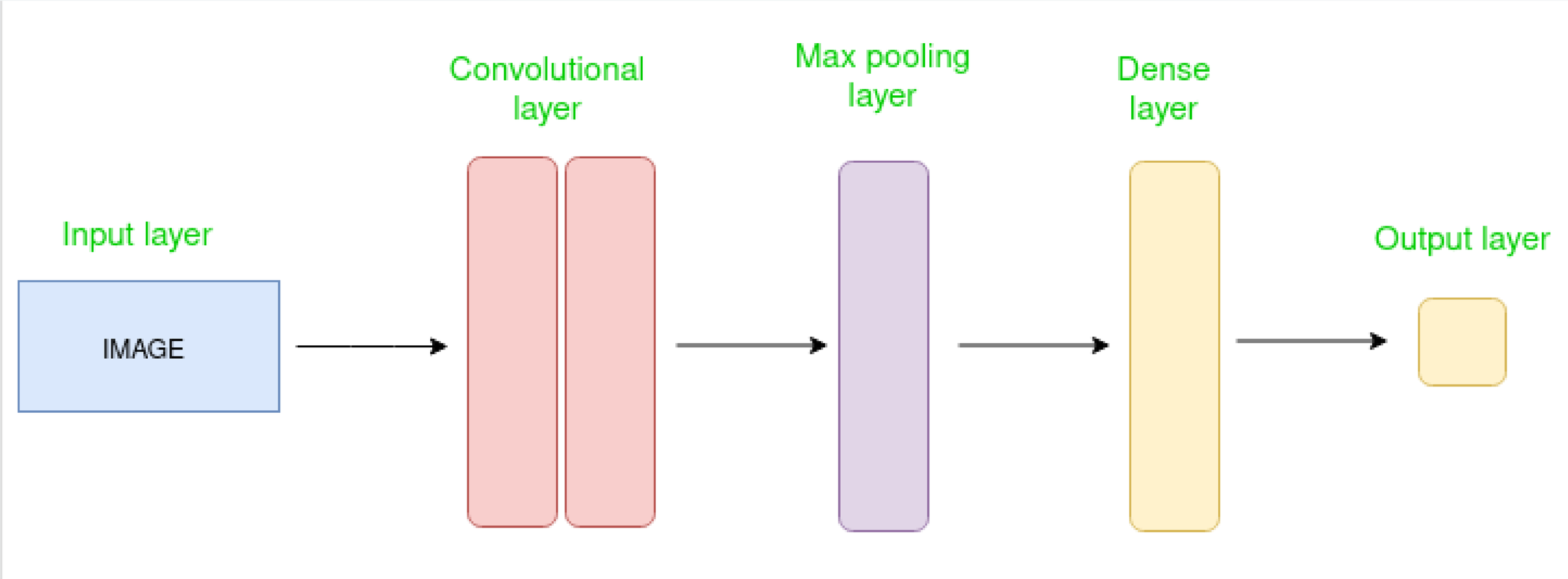
Convolutional Neural Network (CNN)

CONVOLUTIONAL LAYERS





MODEL ARCHITECTURE



Convolutional Neural Network (CNN)

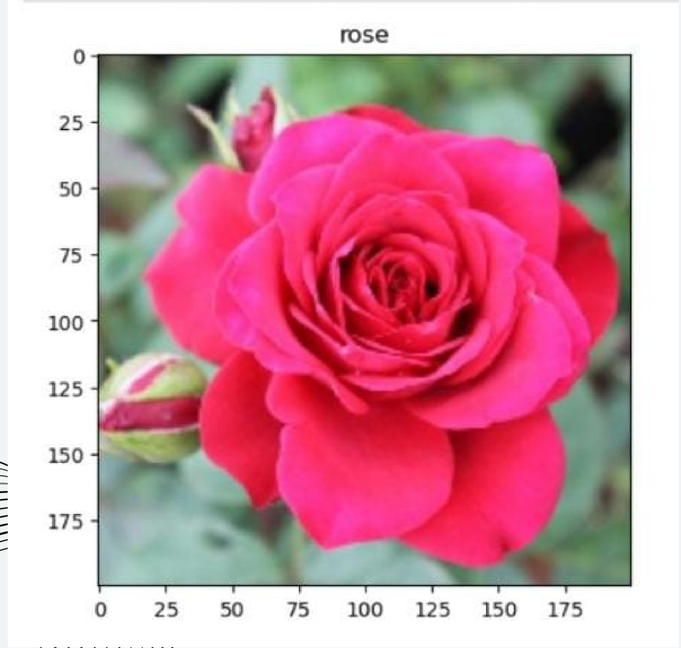
MODEL EVALUATION

```python
cnn.fit(x=training_set, validation_data=test_set, epochs=30)
```

- The model is trained using data from the **training_set,** with parameters updated based on the optimization algorithm and loss function specified during compilation.
- The **validation_data** argument allows the model to evaluate its performance on a separate set of data (test_set) after each epoch. This evaluation is crucial for monitoring the model's generalization ability and detecting overfitting.

SAMPLE PREDICTIONS

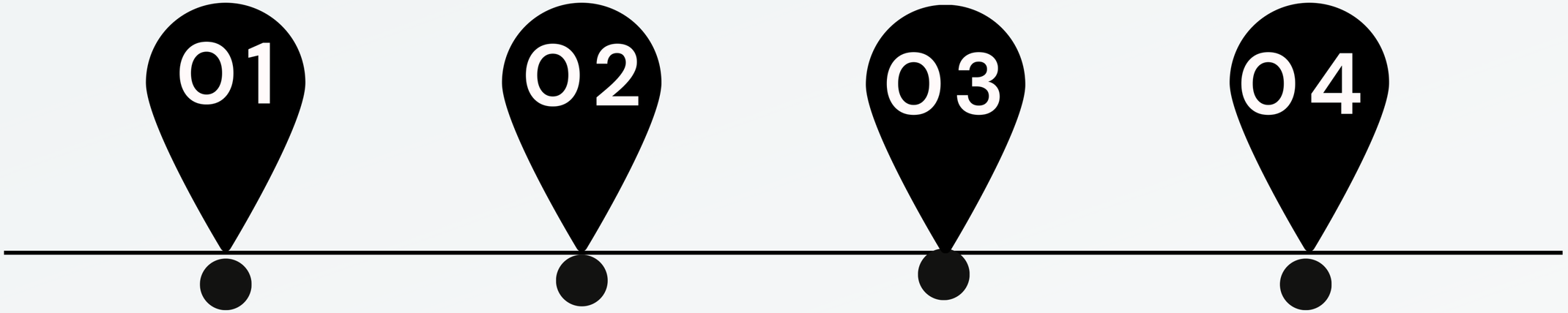
In [26]:
```
import matplotlib.pyplot as plt
predicted_class = categories[np.argmax(result)]
test_image =tf.keras.utils.load_img('prediction/r.jpg',target_size=(200,200))
plt.imshow(test_image)
plt.title(predicted_class)
plt.show()
#test_image = tf.keras.utils.img_to_array(test_image)
#test_image = np.expand_dims(test_image,axis=0)
```



In [22]:
```
category=["Daisy", "Dandaline", "Rose", "Sunflower", "tulip"]
if result[0][0]==1:
    print('Daisy')
elif result[0][1]==1:
    print('Dandelion')
elif result[0][2]==1:
    print('Rose')
elif result[0][3]==1:
    print('SunFlower')
elif result[0][4]==1:
    print("Tulip")
```

Rose

FUTURE SCOPE



DATASET EXPANSION

Augment the existing dataset with additional images of various flower species to enhance model generalization and performance

FINE-TUNING

Explore hyperparameter tuning and optimization techniques to further improve model accuracy and robustness.

USER INTERFACE ENHANCEMENT:

Design an intuitive user interface for seamless interaction with the flower recognition system, facilitating user engagement and usability.

USER INTERFACE ENHANCEMENT:

Develop methods for deploying the trained model in real-time applications, such as mobile or web-based flower recognition tools.

CONCLUSION

In conclusion, the flower recognition project has successfully developed and trained a convolutional neural network (CNN) model capable of accurately identifying different species of flowers from images. The model achieved 87% accuracy on the test dataset, demonstrating its effectiveness in flower classification tasks. Through comprehensive data preprocessing, model construction, and training, we have established a robust framework for automated flower recognition.

THANK YOU

From team: **FLOWER ID**