

Computer Science

AI MODEL Flower Recognition



RecogFlower

Intelligent Web Application

Abstract

Problematic

Objectives

Technologies employed

Model information

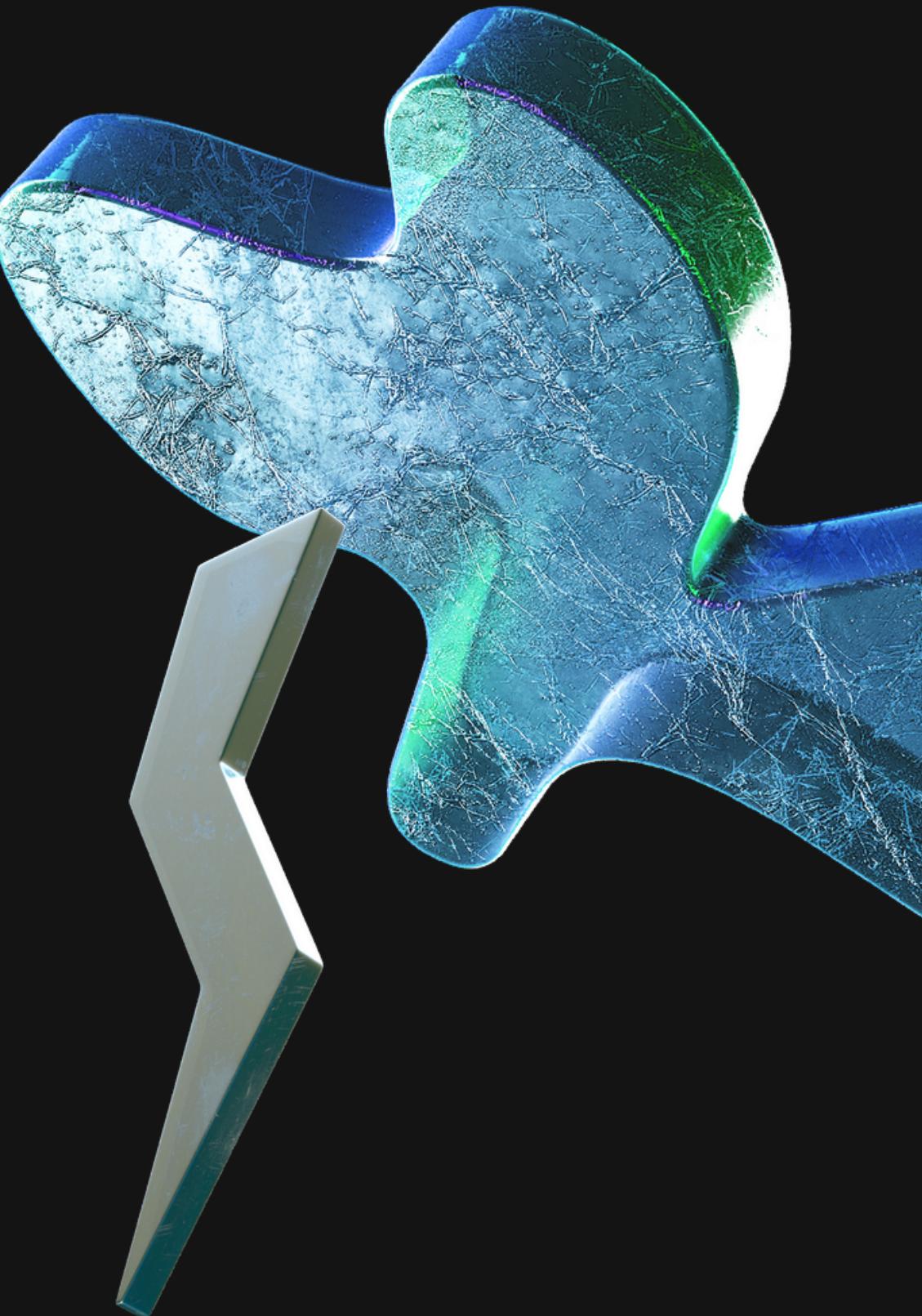
Diagrams

Results

Abstract

RecogFlower

It's a web application which has as main functionality to recognize a type of flower based on an image that an user uploads to the web interface. It uses an artificial intelligence trained model capable of recognizing between three types of the most known flowers in the world, **daisy**, **rose** and **sunflower**.





Problematic

Accurate flower identification is challenging for those without botanical experience, leading to errors in plant care and missed learning opportunities. RecogFlower comes as a tool to help those enthusiastic people with less experience.

Objectives

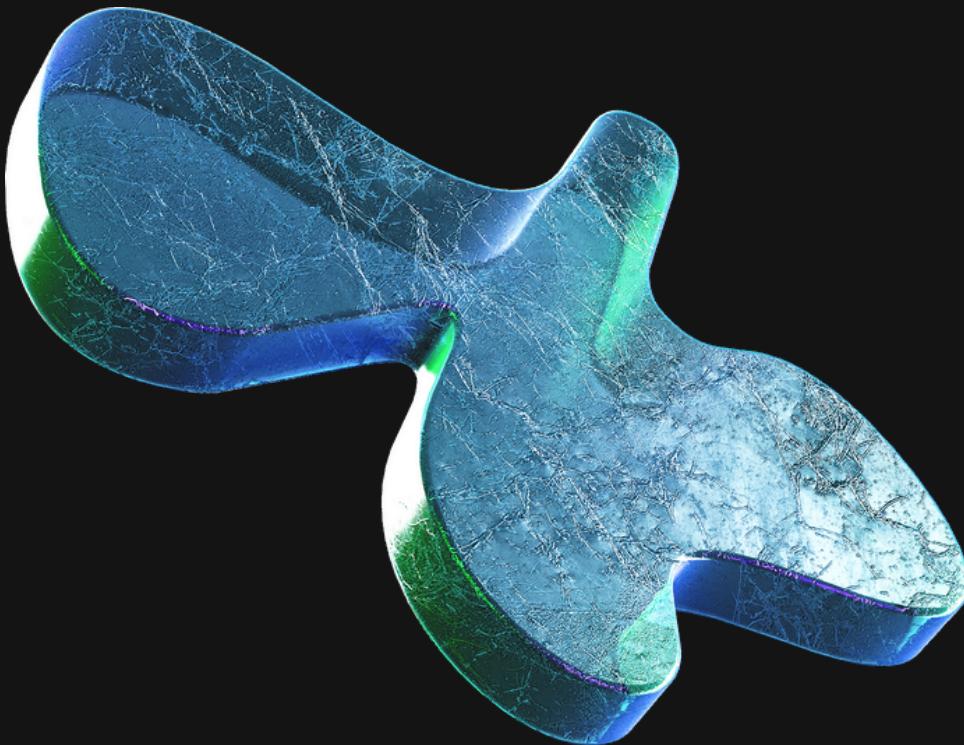
GENERAL

- Build a robust model that allows predicting the typology of a flower with high certainty

SPECIFIC

- Provide the user with an intuitive and efficient application.
- Implement competent technologies in the market that allow scaling the capabilities of the application and projecting it into a production environment.
- Unify two highly important branches of study of the present, artificial intelligence and botany.

Technologies employed



Backend

Laravel PHP

Database interaction, routes, data handling.

Frontend

Bulma

Web application view and visual components.

Use model

Flask

Pre-processing image and consuming model based on an upload image.

Database

ElephantSQL

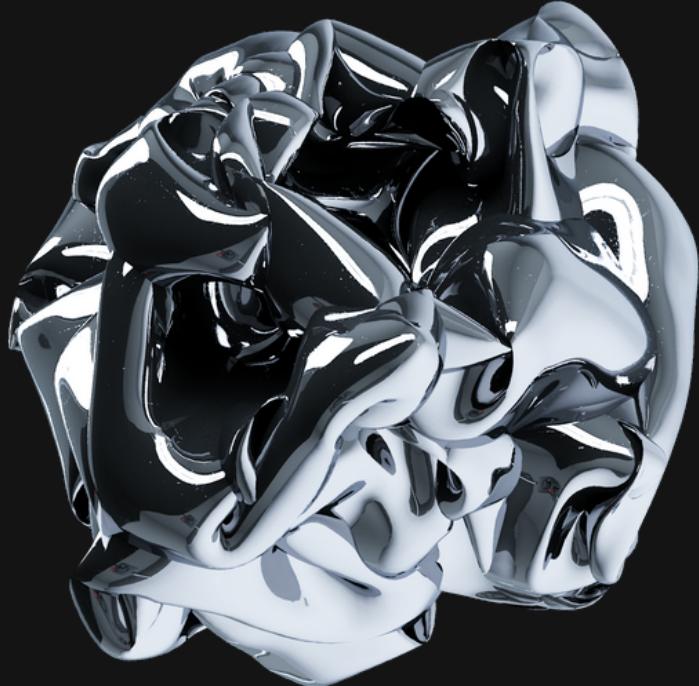
Storage information about the flowers classification to be displayed later.

Model building

Python, tensorflow

Model construction, training validation and testing.

Model information



- Dataset distribution: Daisy (600), Rose (600) and Sunflower (600); 1800 pictures.
- Images processed size: 180x180px
- Model distribution: 80% training and 20% for validation.
- Epochs number: 30
- Final accuracy: 95%

```
# Defining Parameters For Loading
#loc = "C:/Users/Asus/Downloads/Plant-Leaf-Disease-Recognition"
batch_size = 32
img_height = 180
img_width = 180

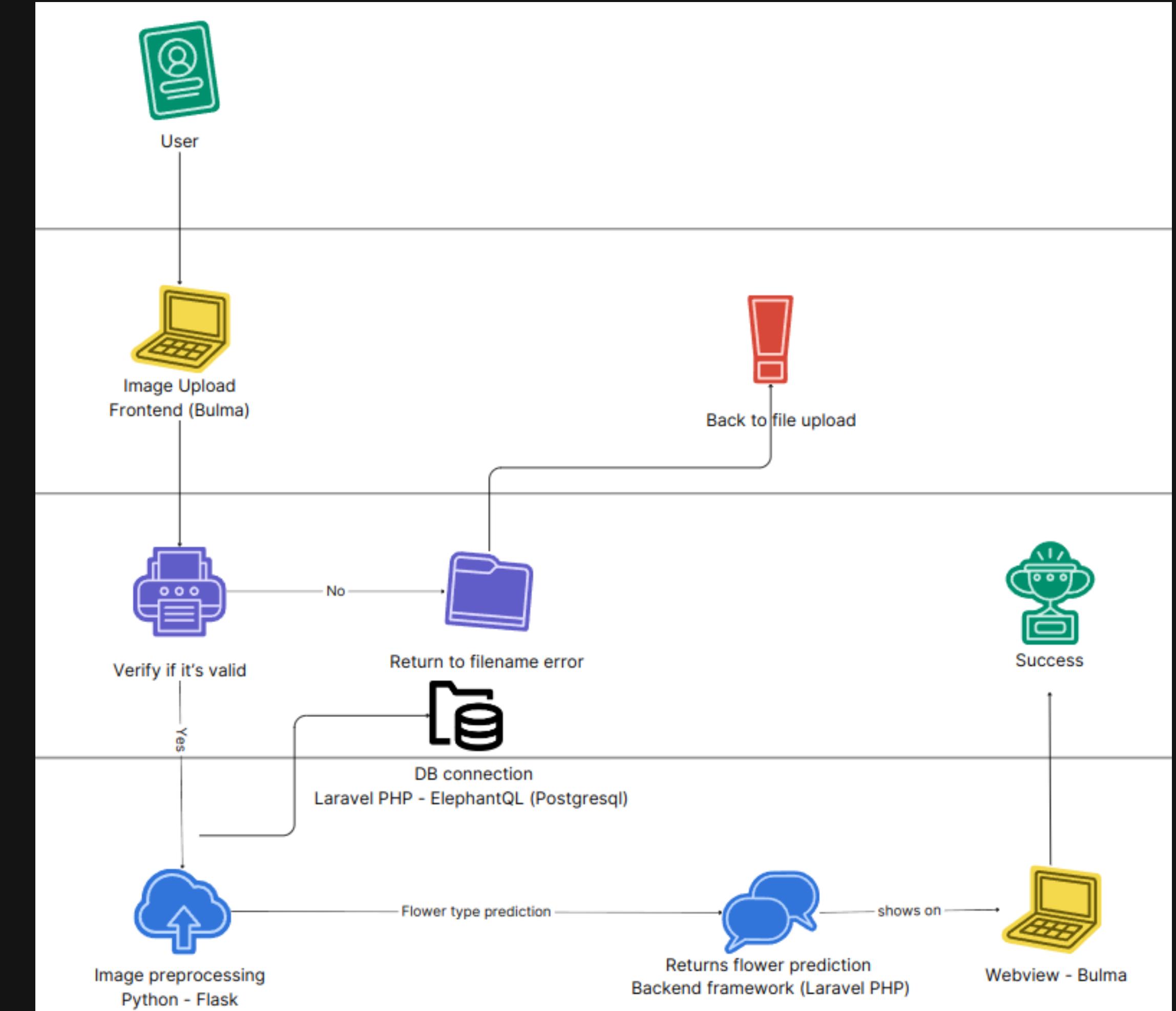
# Building Model
num_classes = 3
# Creating layers using Dropout to handle with Overfitting
model = Sequential([
    data_augmentation,
    layers.experimental.preprocessing.Rescaling(1./255),
    layers.Conv2D(16, 3, padding='same', activation='relu'),
    layers.MaxPooling2D(),
    layers.Conv2D(32, 3, padding='same', activation='relu'),
    layers.MaxPooling2D(),
    layers.Conv2D(64, 3, padding='same', activation='relu'),
    layers.MaxPooling2D(),
    layers.Dropout(0.3),
    layers.Flatten(),
    layers.Dense(128, activation='relu'),
    layers.Dense(num_classes)
])
```

```
# Data Augmentation - Handle with Overfitting
data_augmentation = keras.Sequential(
    [
        layers.experimental.preprocessing.RandomFlip("horizontal",
                                                     input_shape=(img_height,
                                                                 img_width,
                                                                 3)),
        layers.experimental.preprocessing.RandomRotation(0.1),
        layers.experimental.preprocessing.RandomZoom(0.1),
    ]
)

# Compiling Model - Training Stage
model.compile(optimizer='adam',
               loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
               metrics=['accuracy'])

epochs=30
history = model.fit(
    train_ds,
    validation_data=val_ds,
    epochs=epochs
)
```

Proposal solution diagram



Mockup

RecogFlower Main Classification Playground

Flowers Recognition

RecogFlower is a web application that allows the user to identify the class or type of a flower based on three previously established classes. This application makes use of an artificial intelligence model already trained to predict the type of flower the user enters through an image.

Classification - Flowers of the model



Margarita

La margarita es una flor pequeña y delicada con pétalos blancos y un centro amarillo.



Girasol

El girasol es conocido por su gran cabeza floral y sus brillantes pétalos amarillos que siguen al sol.



Rosa

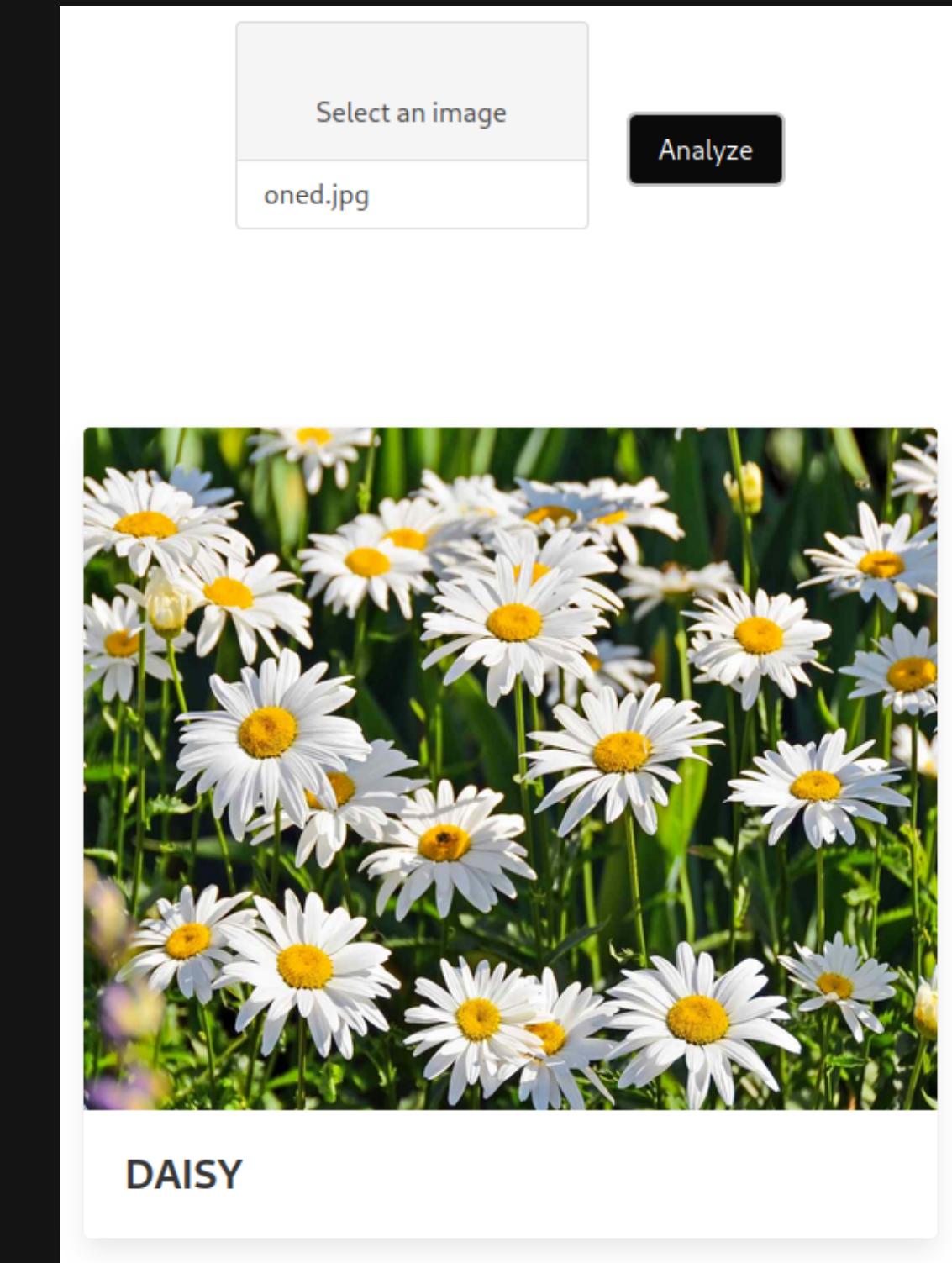
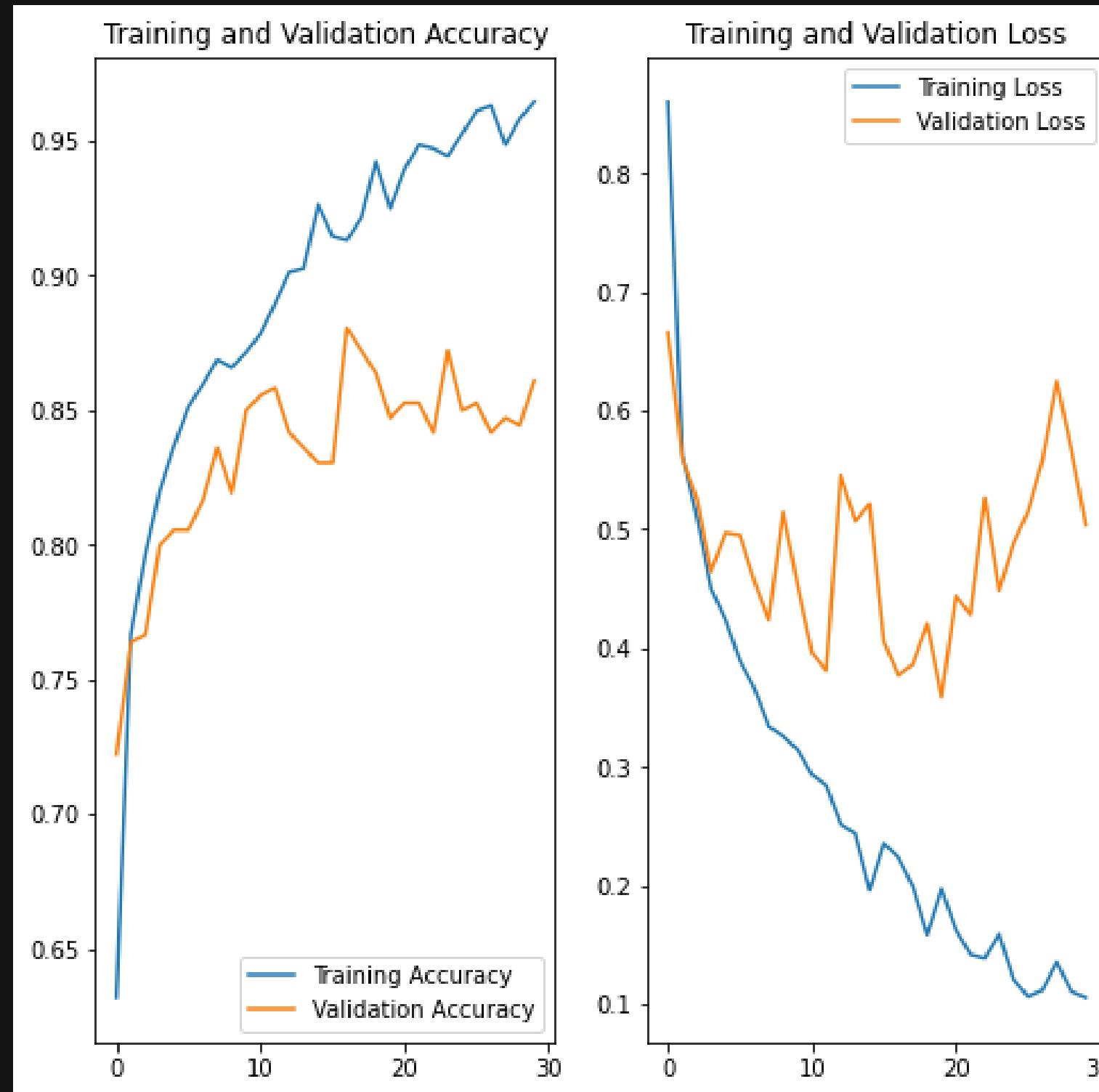
La rosa es una flor elegante y fragante que viene en una variedad de colores y se utiliza a menudo como símbolo de amor y afecto.



DataBase diagram

flowers_info	
id	serial
name	varchar(255)
img_path	varchar(255)
description	text

Results



End

