Coraline Wang

Flower Images Recognition based on Deep Convolutional Neural Network

Department of Computer Science, Chengdu University of Technology, Oxford Brookes University
Supervised by Dr Happy Nkanta Monday

OXFORD BROOKES UNIVERSITY

Abstract

The purpose of this study is to design and implement a flower image recognition system based on deep convolutional neural network by computer, which can recognize ten different flowers and facilitate users to recognize, classify and appreciate flowers.

Introduction

Flower image recognition has always been a research hotspot in deep learning[1]. The data set used in this project comes from Kaggle and contains ten categories of flowers [2].
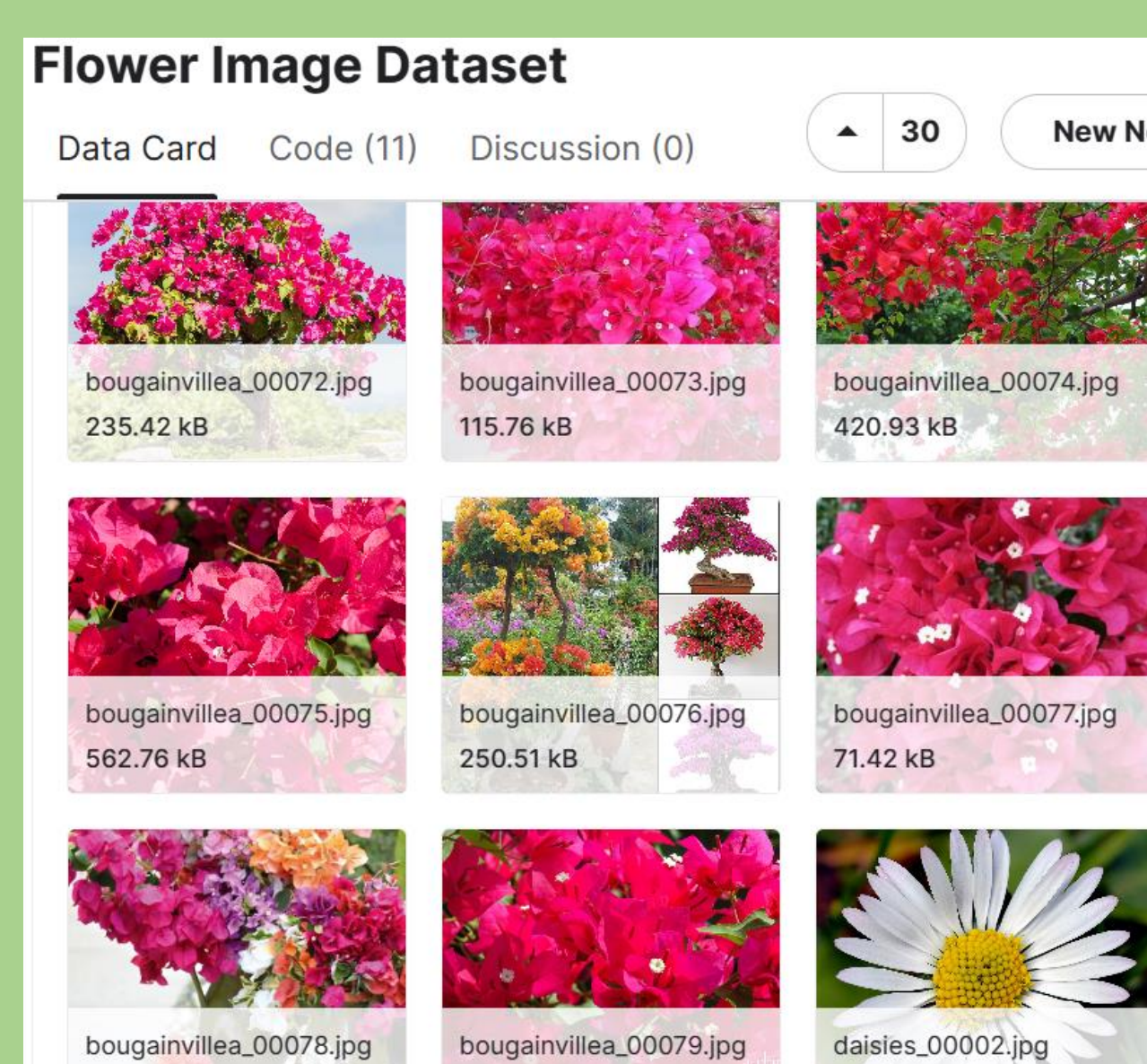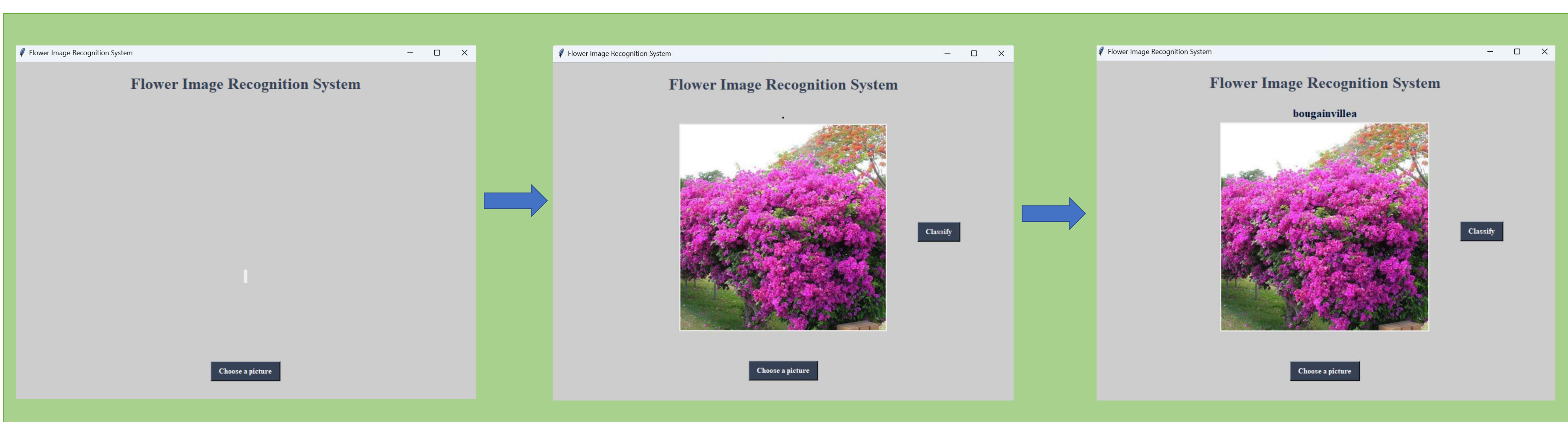

Figure 1: Flower image dataset

Method

Dataset	CNN	Deep Learning Framework	GUI
Kaggle	ResNet-18	Pytorch	Tkinter

Table 1: Technology

In this paper, about 1000 images of ten kinds of flowers were collected by Kaggle to construct the flower image recognition data set of this paper [3]. Secondly, Pytorch deep learning framework is used to build and train the convolutional neural network for flower image recognition. The model is Resnet18. Finally, a flower image recognition GUI is designed and implemented by using trained convolutional neural network combined with Pytorch and Tkinter[4],[5].

Model Design

Figure 2: ResNet18 architecture

Result & Discussion

Due to the limited equipment performance and data set size, according to the line chart, the highest training accuracy is 99.6%, with an average of 96%, and the highest validation accuracy is 92%, with an average of 86.8%.
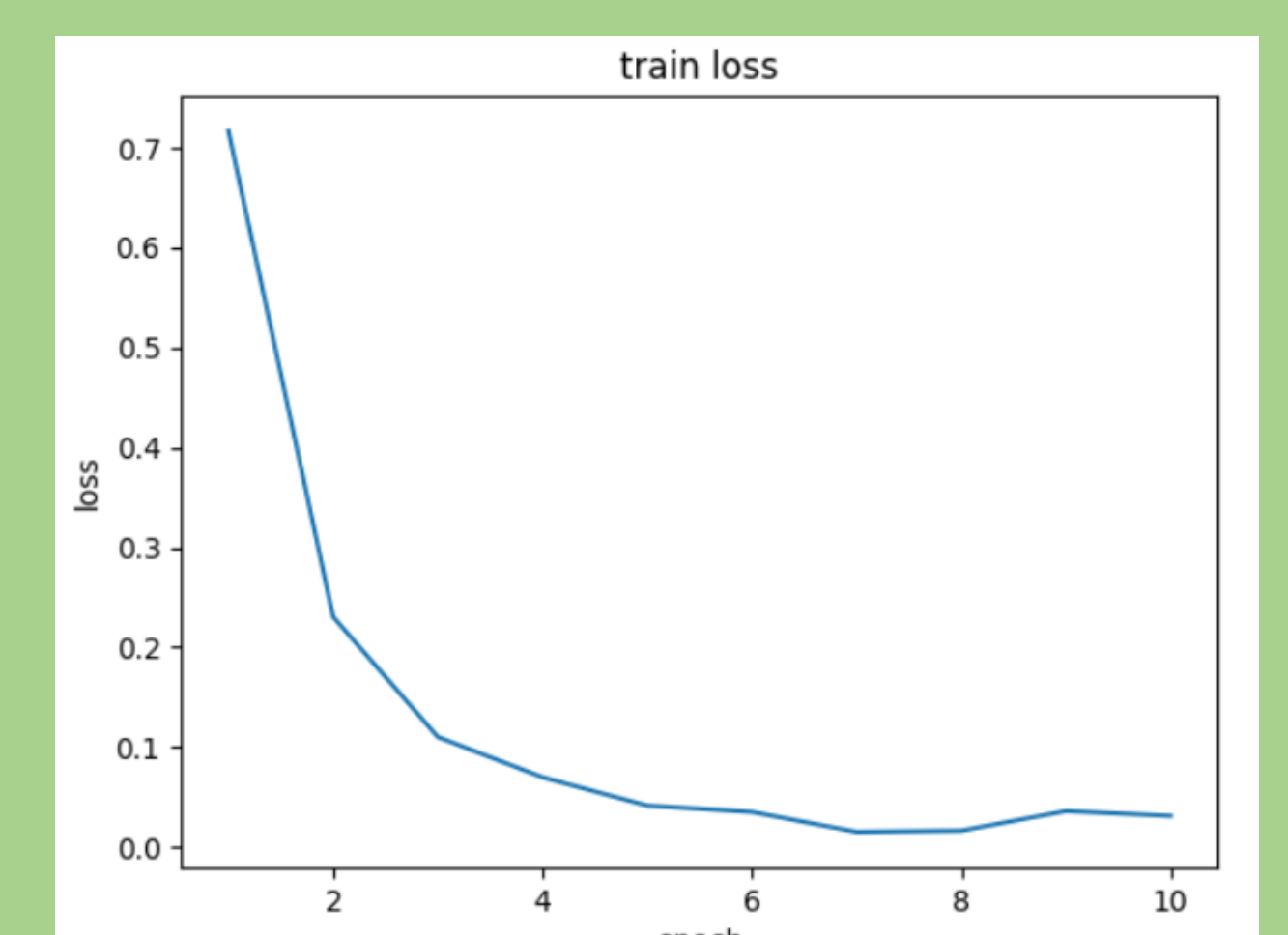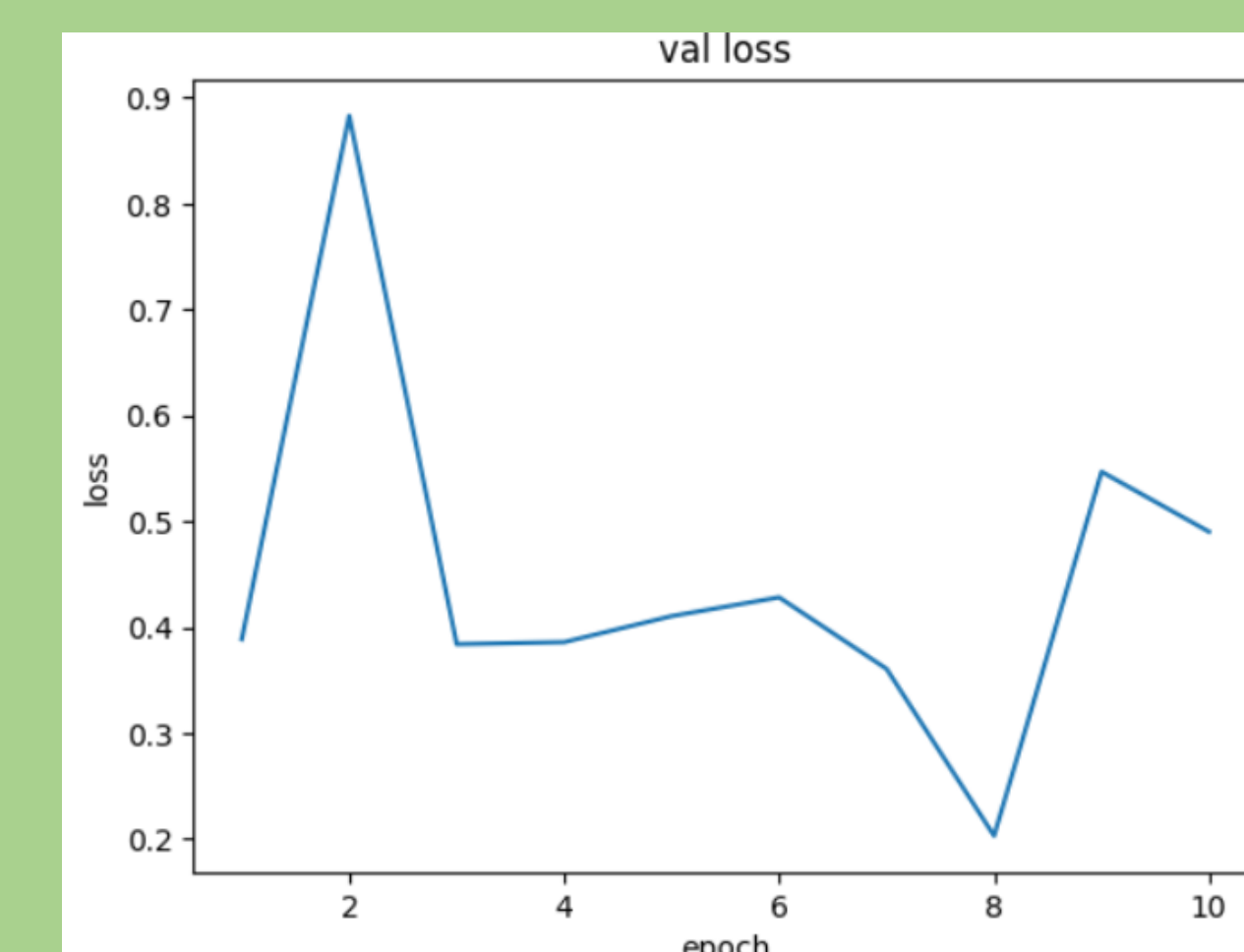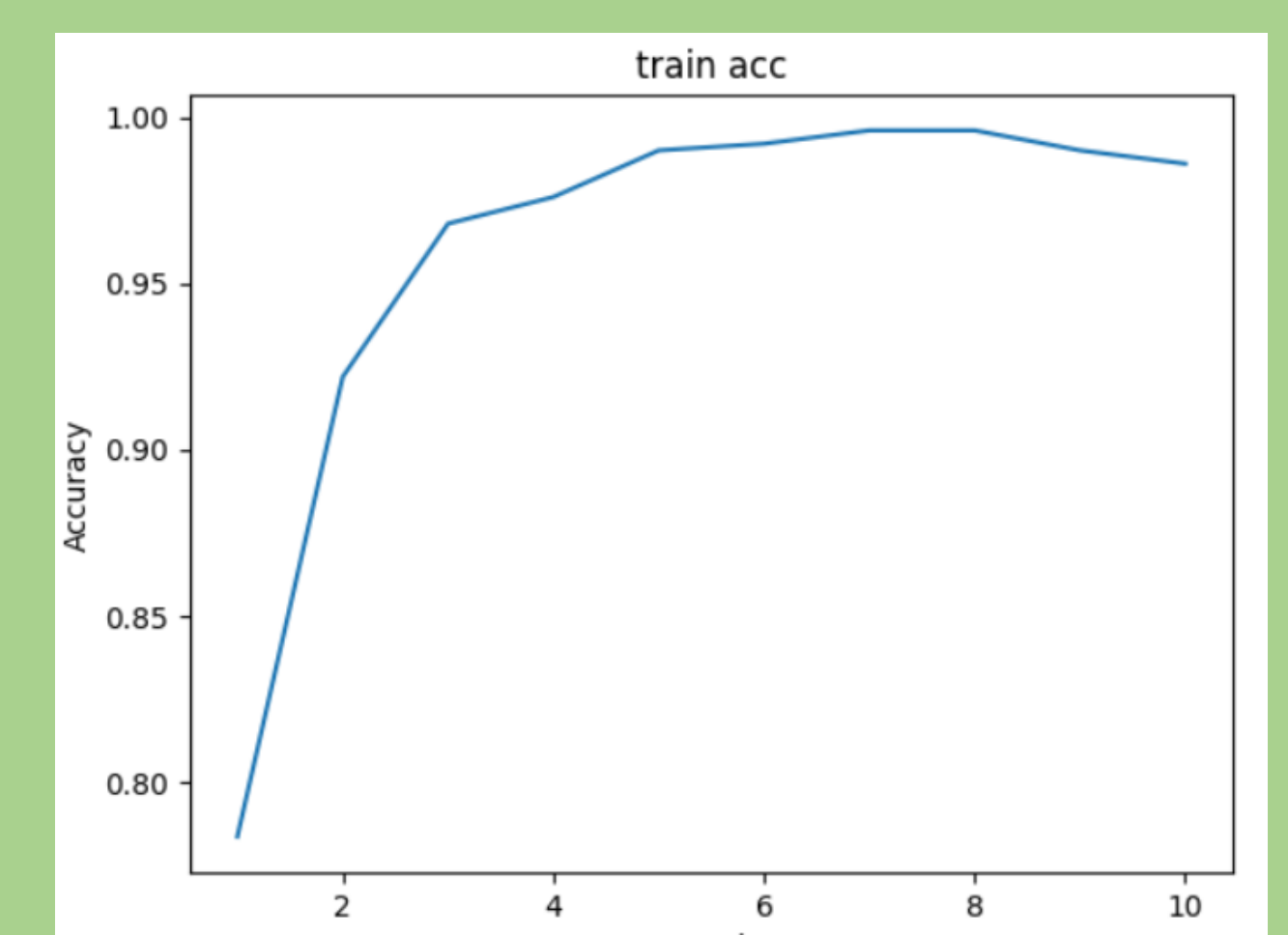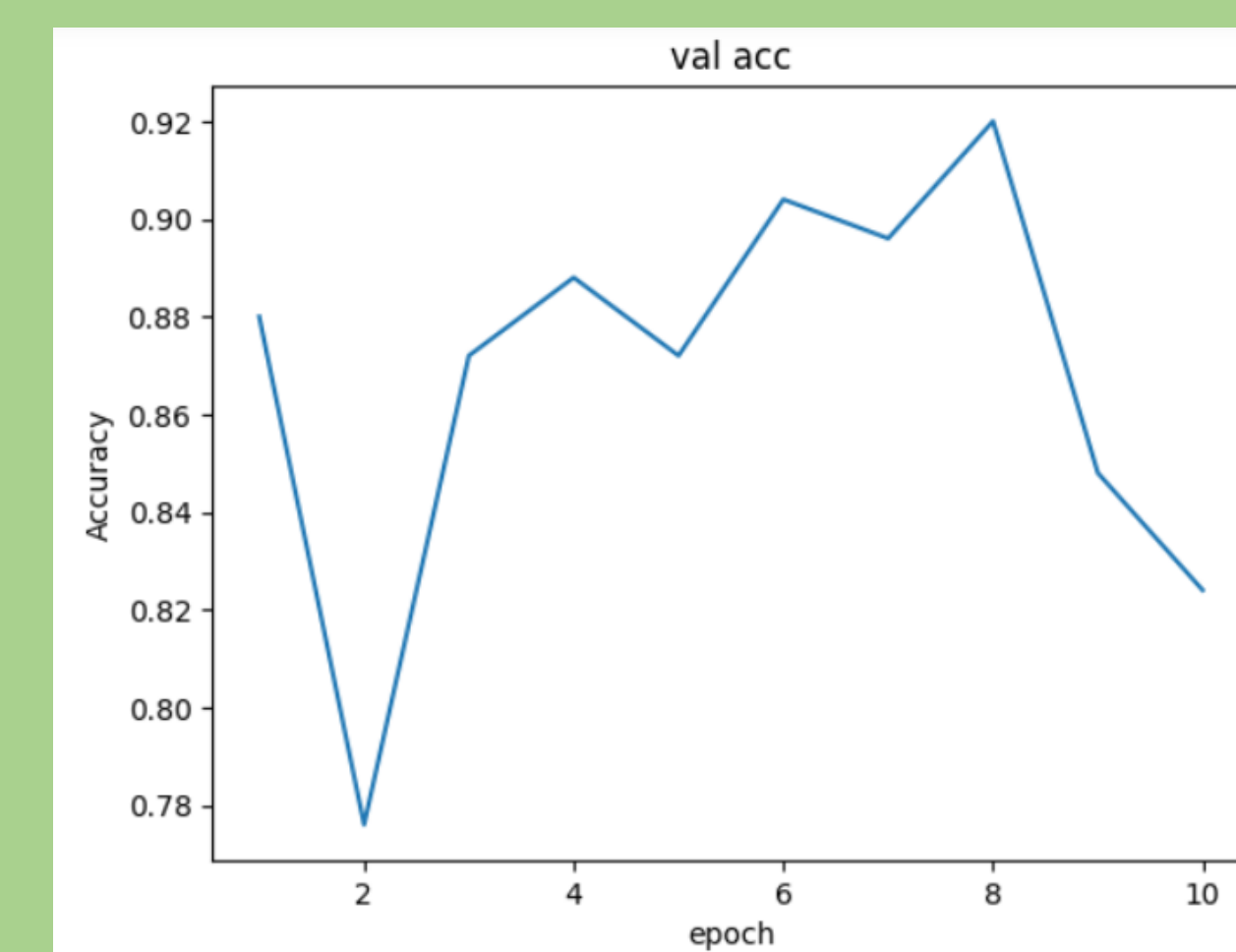
Conclusion

Although the flower recognition system designed by this project is usable and stable after testing, due to the limitations of time and other aspects, there are still many areas to be improved. For example, there are only ten sample types of flower data set at present, which need to be enriched. In addition, the GUI interface is still rudimentary and could be improved in the future.

Result of GUI

References

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