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Flower Image Classifier

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Introduction

There are different kinds of flower species and through the use of labelled image dataset, we seek to classify flower images into classes of different species.

Use Case

Research in Botanical studies

As there large no. of flower species, an image classifier of flowers is extremely useful in their studies and finding new flower species

Scope

- Supervised deep learning classification task
- Develop a model to classify flower images into 102 different species

Features

- Data Augmentation
- Transfer learning from a pre-trained model (ResNet 152) for feature extraction
- Convolutional Neural Network (CNN) using PyTorch

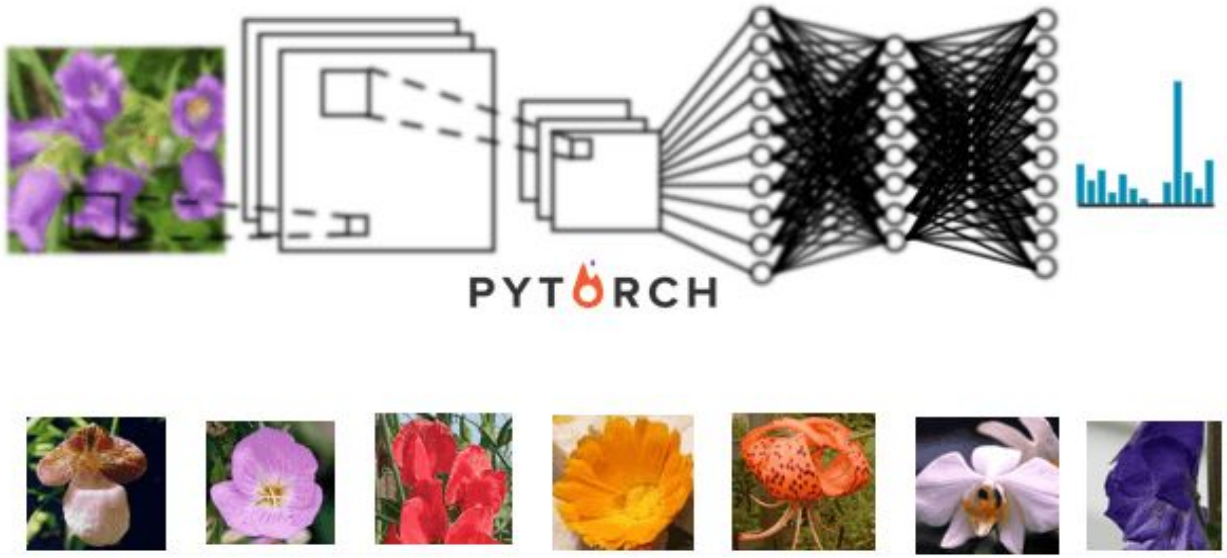
Data Source

- Automated flower classification over a large number of classes:

  Proceedings of the Indian Conference on Computer Vision, Graphics and Image Processing (2008)

  http://www.robots.ox.ac.uk/~vgg/data/flowers/102/
- 102 flower categories. Each class consists of between 30 to 158 images.
  - Training and validation dataset contains 6552 images
  - Testing dataset consists 2860 images

How CNN Works



AWS Cloud Services

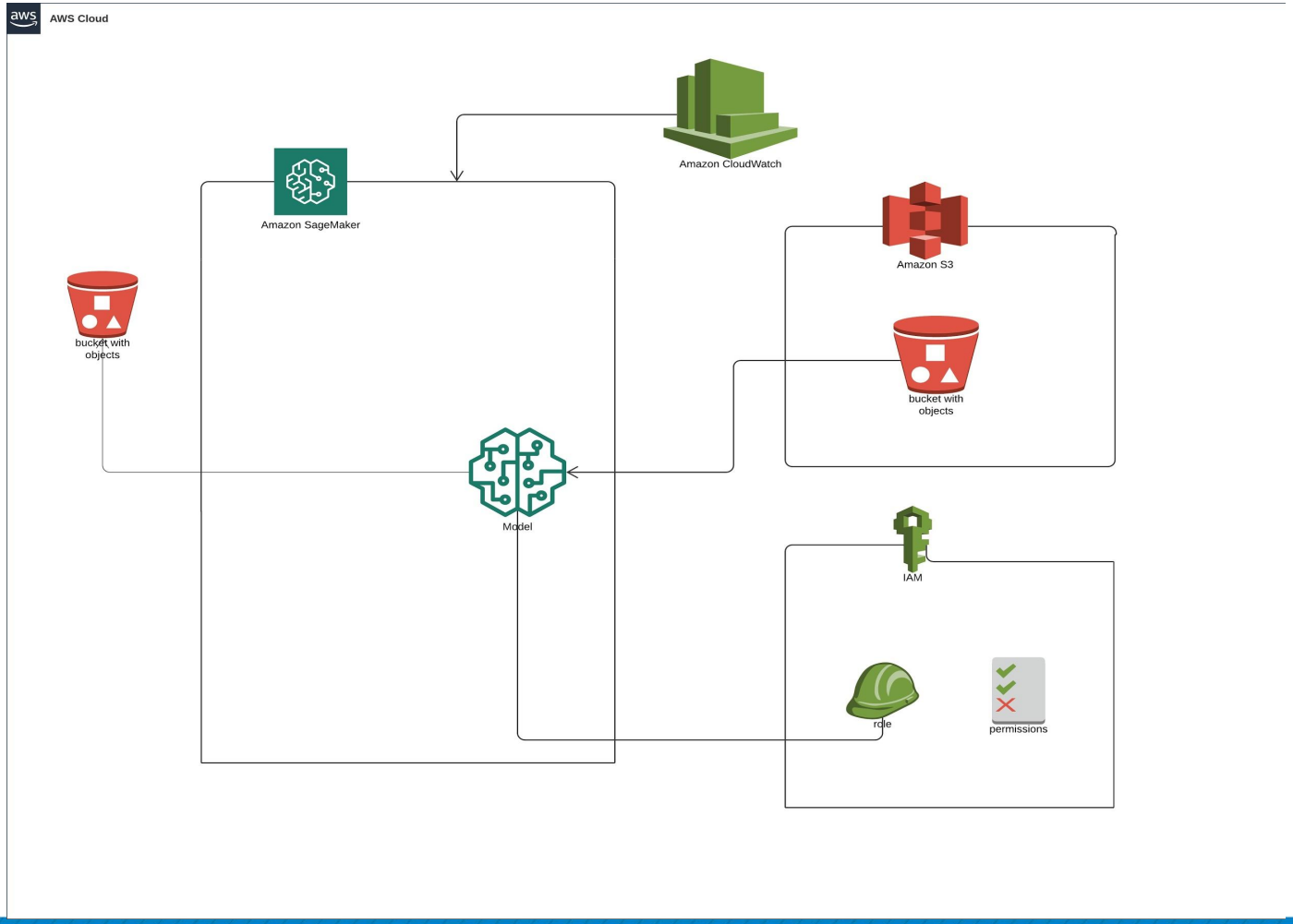
Amazon SageMaker

Amazon S3

AWS Identity and Access Management

Amazon CloudWatch

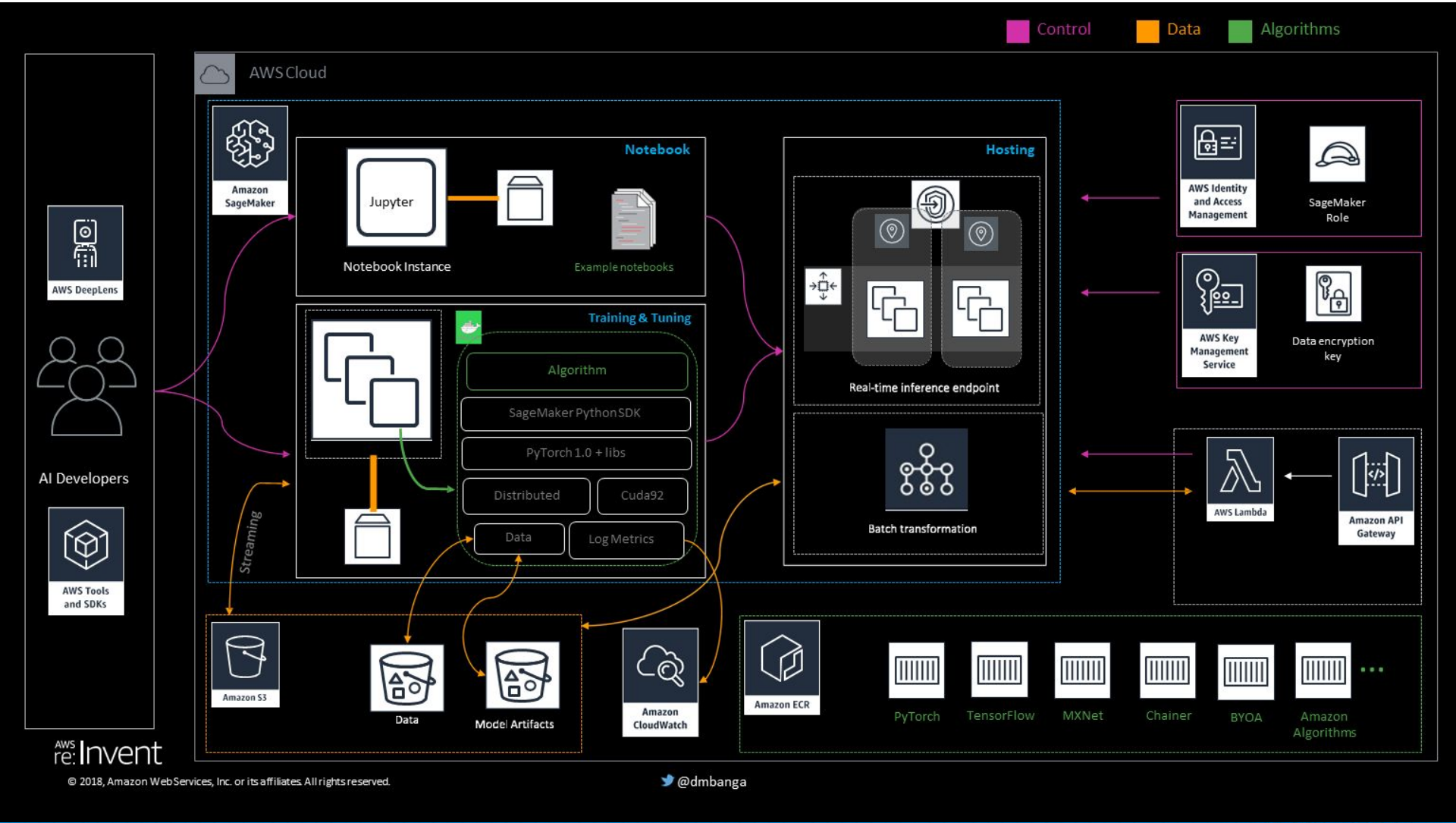
Architecture



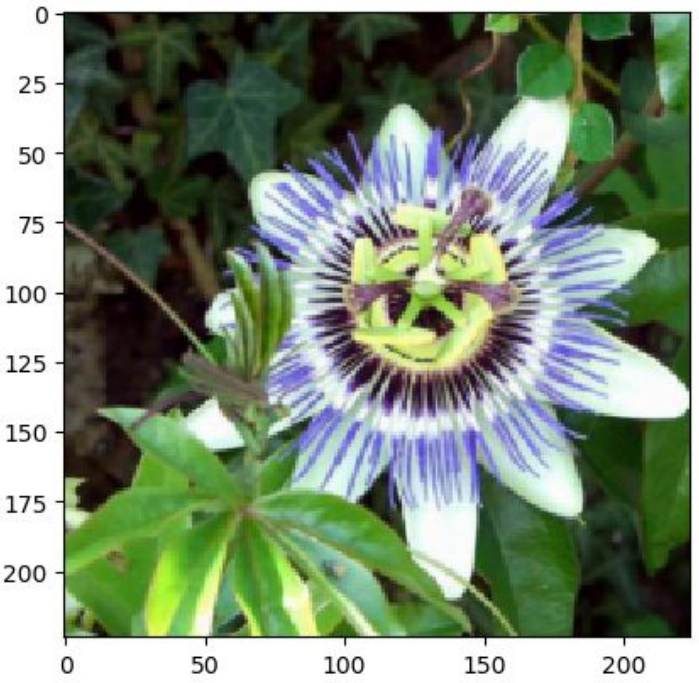
Training Parameters

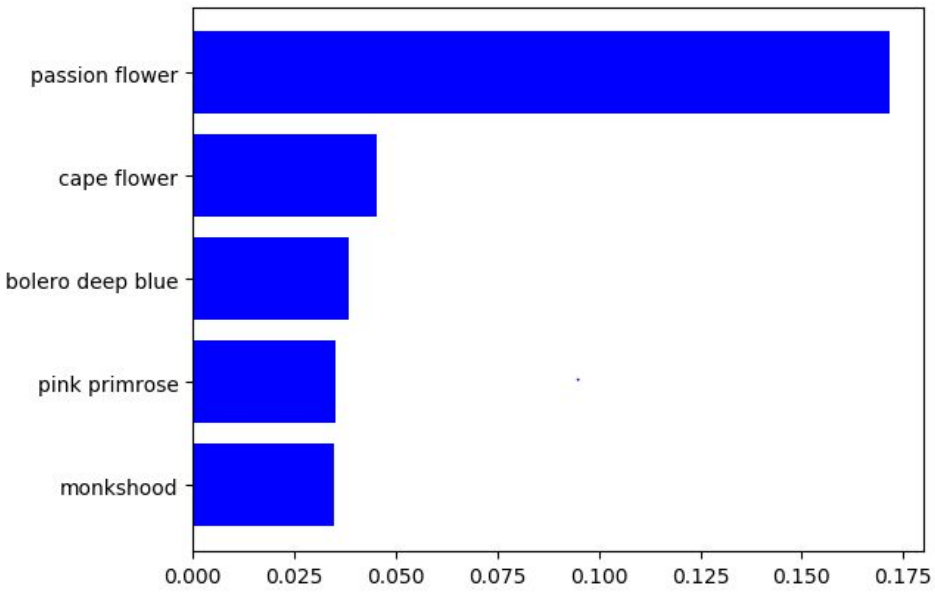
Parameter	Value
Pre-trained Model	ResNet 152
Fully Connected Layer I	2048 x 512
Fully Connected Layer II	512 x 102
Activation Function	ReLU
Dropout	0.25
ML Instance (Compute)	ml.p2.xlarge
Learning Rate	0.01
Deep Learning Framework	PyTorch

Logical Structure of Sagemaker



Results





Demo

Thank You