Rishabh Software

Guide: Mr. Kshitij Tripathi

I42 Vraj Kotwala
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Internship Summary

Guide at Rishabh Software: Mr. Gagan Dubey

How Rishabh Software is different?

Domain

A project based on AI and Machine Learning

Project Definition

EmotiBot - Emotion Recognition Bot

The project aims to classify the emotion on a person's face into one of the seven categories, using deep convolution neural networks.

Scope

1. Recognize face (multiple faces) from camera input
2. Recognize Emotions from 7 classifications:
    a. Angry, Sad, Happy, Disgusted, Fearful, Neutral, Surprised
3. Provides Accuracy and Logs with Graphics Interface
4. Save logs into database for further analysis.

Tools & Technology used

- Anaconda (Virtual Env.)
- Jupyter for testing
- PyCharm for development
- MySQL

Libraries in python 3:

- tkinter
- openCV
- Numpy (arrays)
- Statsmodels
- matplotlib
- Tensorflow, Keras

Agile Methodology

Agile software development comprises various approaches to software development under which requirements and solutions evolve through the collaborative effort.

Scrum

What we learnt from Udemy?

- What is Data-Science?
- What is ML?
- Probability
- Inferential Statistics
- Advance Statistics in python
- Regression & Cluster analysis in sklearn
- Matplotlib & statsmodels
- Matrices & Tensors
- Deep Learning and Neural Networks using Tensorflow

Implementation

Master Algorithm

- First, we use **haar cascade** to detect faces in each frame of the video. We use this to collect data.
- The region of image containing the face is resized to **48 x 48** and is passed as input to the ConvNet. This is to train the model.
- Again, we use **haar cascade** to capture faces in each frame from web cam. The network outputs a list of **softmax scores** for the seven classes.
- The emotion with maximum score is displayed on the screen.

Vraj Kotwala

Work distribution on his side

Collect Data

Collection of data from various sources.
Like YouTube, Google images, Kaggle, etc.

Statistical Classification

Error finding using Confusion Matrix

Designing Algorithm

Using CNN in Tensorflow.

Data Preprocessing

Gray-scaling images for faster processing of data.
Resizing images for making coding easy and accurate.

Improving Accuracy

Will try to improve model for >90% accuracy

Database Connection

Storing logs into database for further analysis.

Jayati Goswami

Work distribution on her side

Study of papers & courses from Udemy

Data-Science with python.
Study of exsisting systems.

Classification

Classification of data images into 7 groups:

Angry, Sad, Happy, Disgusted, Fearful, Neutral, Surprised

Research Paper

How does your product or service fit into the grandscheme of things?

Collect Data

Collection of data from various sources.

Data Preprocessing

Cleaning of noisy data.

Data Seperation

80% Train data.
20% Test data.

Database Modelling

Probably MySQL.

GUI in Tkinter

Graphical User Interface, window menu. For easy Interaction.
Tkinter GUI toolkit for python 3.
Plannig to switch to PyQt in future.

GUI integration

integration of GUI with openCV

Ingredients of Training Algorithm

Data

Collection of Dataset.

Model

Create a model. Find some coefficients. A model, loosely speaking, is a simplification of some thing or process.

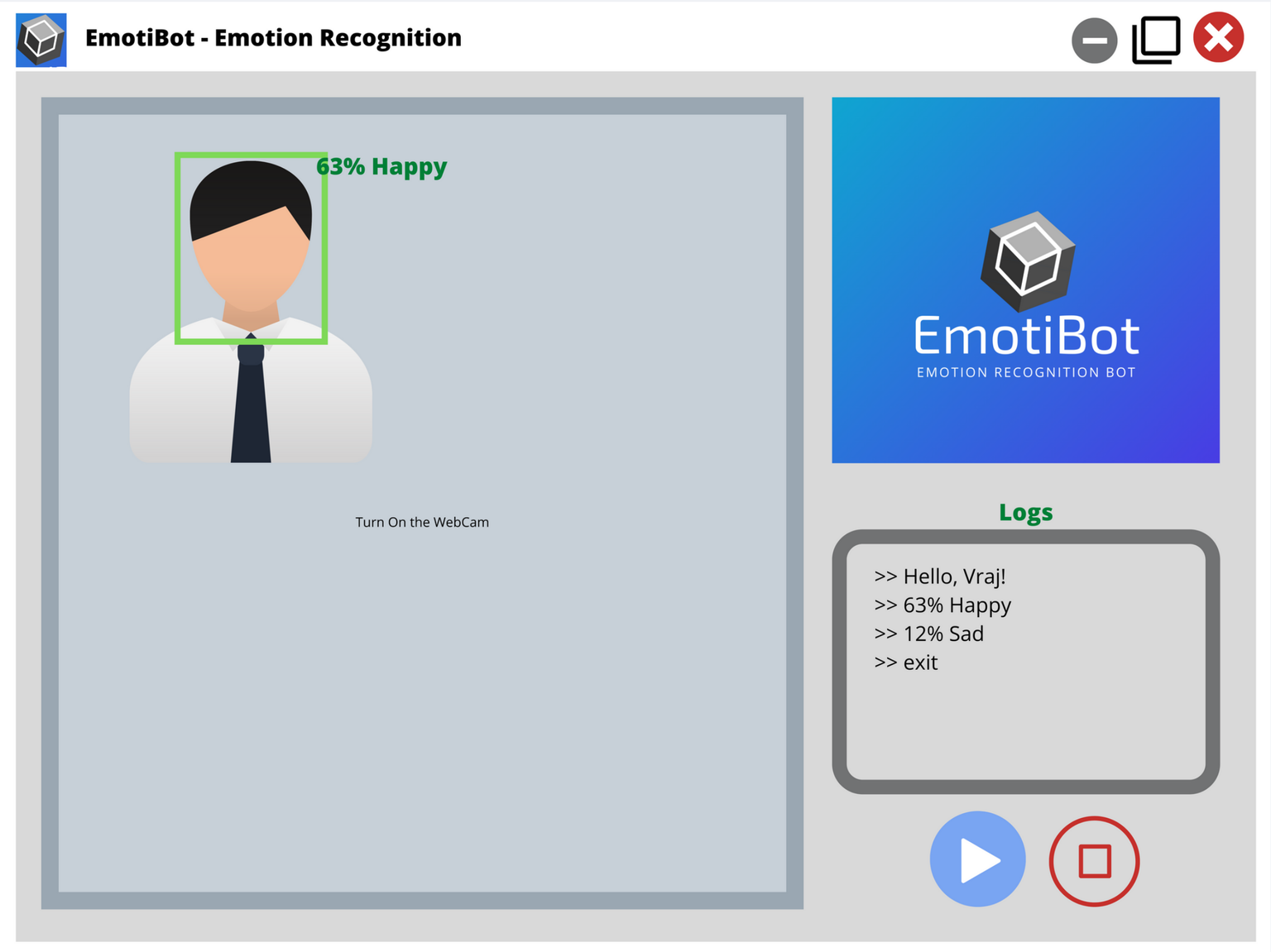
Objective Function

This function, taking data and model parameters as arguments, can be evaluated to return a number. Classification and cross entropy.

Optimization Algorithm

a function that minimizes an error or one that maximizes reward over punishment. By using Adam Algorithm.

Demo GUI


EmotiBot - Emotion Recognition
63% Happy
Turn On the WebCam
EmotiBot
EMOTION RECOGNITION BOT
Logs
>> Hello, Vraj!
>> 63% Happy
>> 12% Sad
>> exit

Work done till date

1. Data Collection Code
2. Data Preprocessing
3. Confusion Matrix & Classification
4. GUI
5. Basic Training of model

Future Roadmap

Improvising Accuracy & GUI integration

March End

DB modelling & connection

Mid April

Research Paper

April End

Thank You

I42 Vraj Kotwala

I43 Jayati Goswami