Recognizing Facial Expressions Using a Convolutional Neural Network Model

Learning facial expressions from an image

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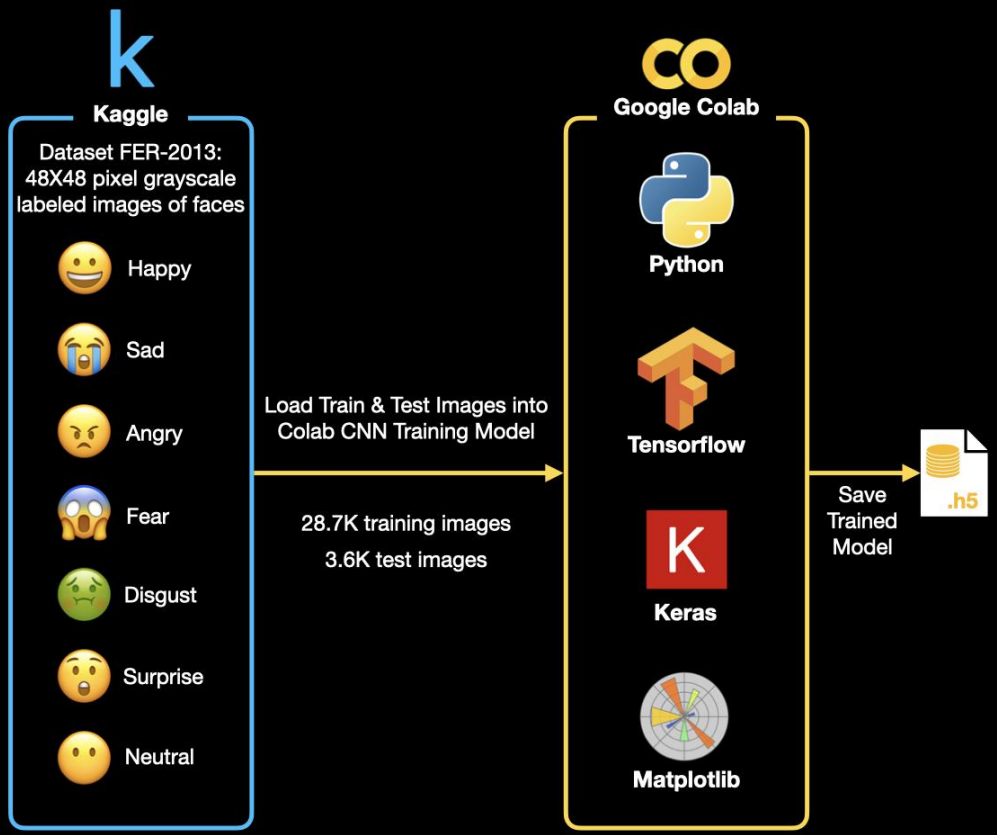
Emoji the Possibilities: Convolutional Neural Network (CNN) Model



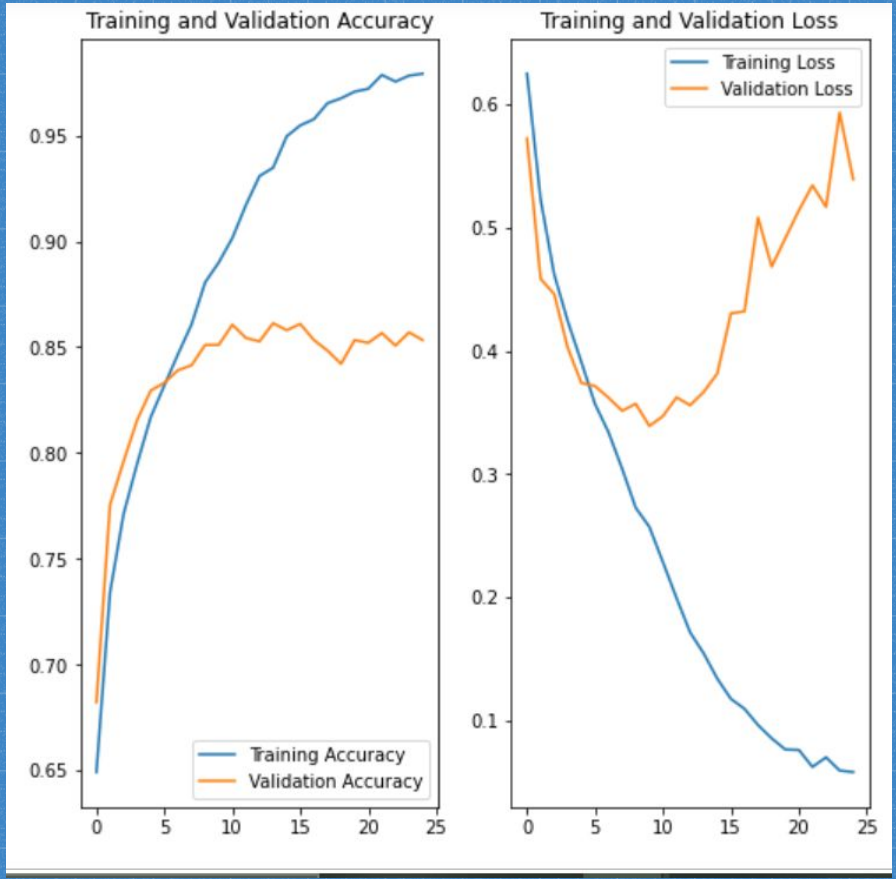
CNN Model Benefits

- Detects image features without human supervision
- High accuracy rate for image classification and recognition
- Proven effective with video and patterns in addition to face recognition

CNN Model Limitations

- Requires a relatively large data set to process and train the neural network
- Missing pixels can have a negative impact on the model verification process
- As CNN models typically have several layers, the training process can take hours even with computers that have a high performance GPU

Accuracy Graphs

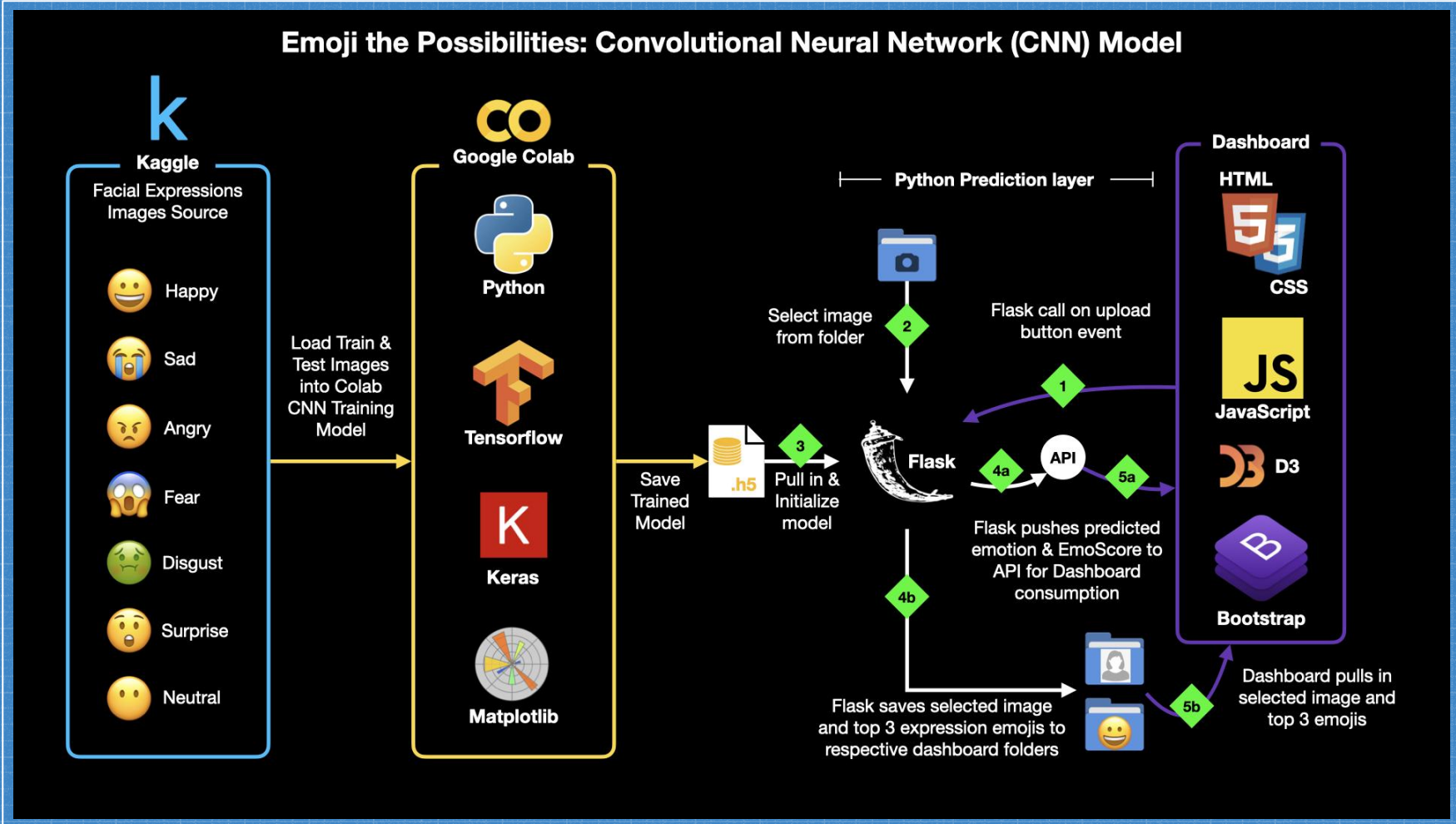


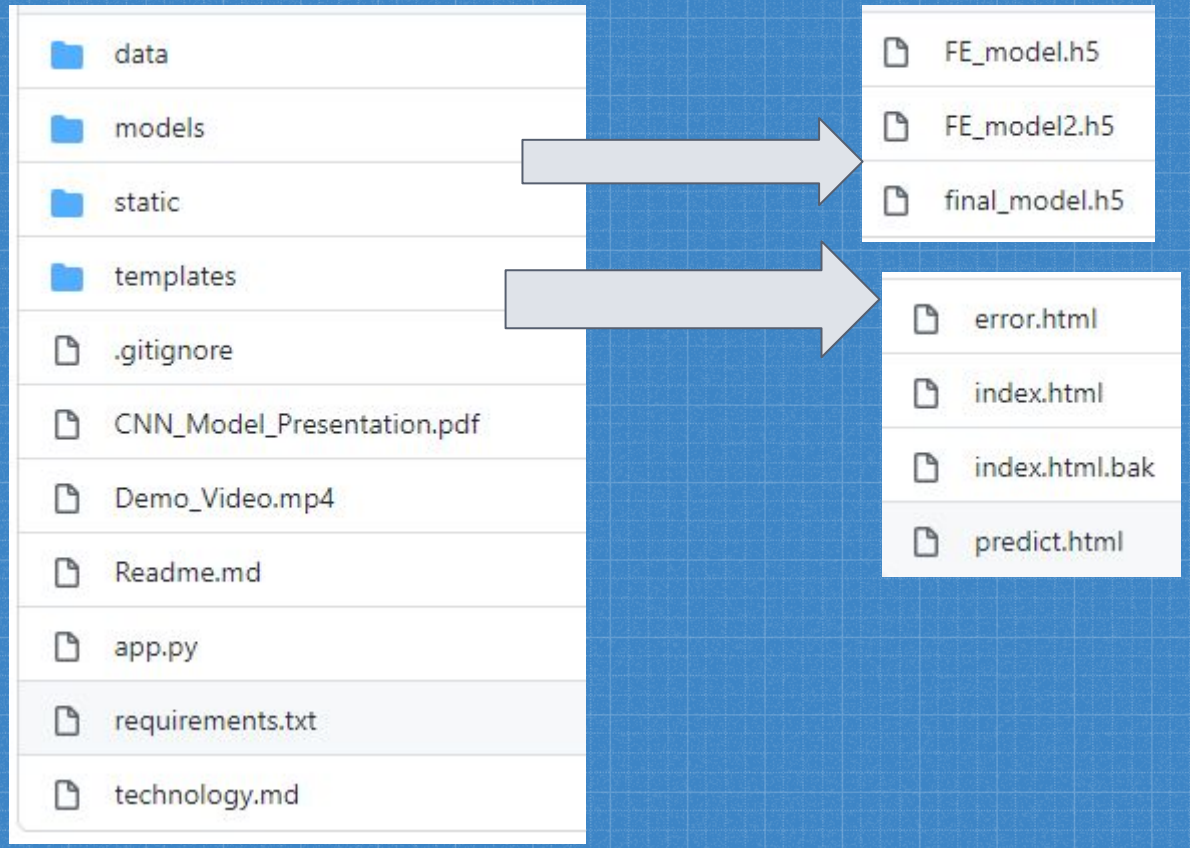
Final model:

loss: 1.0531

accuracy: 0.7403

Emoji the Possibilities: Convolutional Neural Network (CNN) Model




data
models
static
templates
.gitignore
CNN_Model_Presentation.pdf
Demo_Video.mp4
Readme.md
app.py
requirements.txt
technology.md
FE_model.h5
FE_model2.h5
final_model.h5
error.html
index.html
index.html.bak
predict.html

```
<div class="jumbotron"><div class="jumbotron">
            <h1 class="display-5">Emoji The Possibilities</h1>
        </div>

        <div class="container-fluid">
            <div class="row">

                <div class="col-md-3">
                    <!-- Bring in image with buttons for upload new file and running
model-->
                    <!-- Add event listeners for the buttons -->

                    <h3>Image Selected</h3>

                        <!-- if images is False/None/non-existent, then default to error
message -->
                        <img
                            src="../static/images/selected_img.jpeg"
                            style="width:350px;height:350px;"
                        />
                </div>
```

Lessons Learned

All team members must have the same program versions installed

Tensorflow doesn’t work on a Mac M1

Assistance was required on the API solve

Future Enhancements

Augment the dataset with color images

Add functionality to incorporate an image taken from a camera

Ability to confirm model results

Create a database of classification results

Zoom plug-in to provide autistic people with a support tool that monitors the expressions of others on a Zoom call