Module Description: Artificial Intelligence

Practical Assignment: Training a Machine Learning Model with Teachable Machine

Data Collection

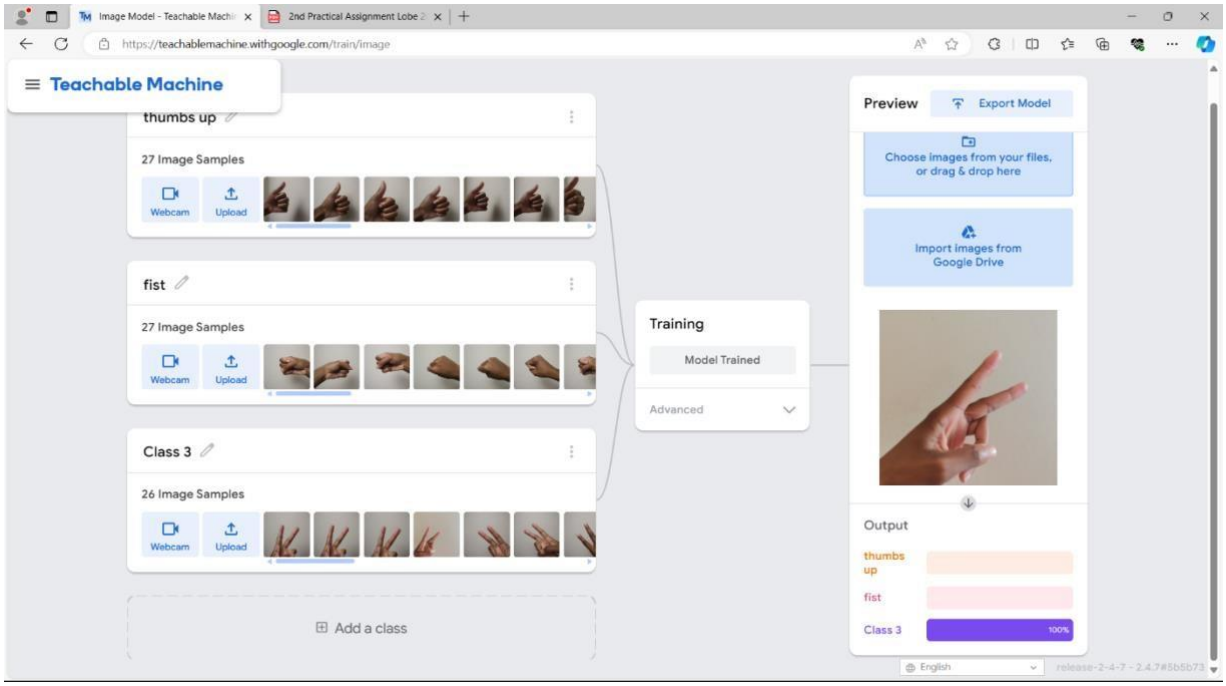
There were setbacks and achievements in the hand gesture data collection procedure. One of the challenges was getting a varied dataset with different backgrounds, lighting, and hand positions. It was difficult to ensure that gestures were inclusive because hands differed so much in size and shape. Still, a comprehensive dataset was made possible by the combination of crowdsourced data and controlled environment captures.

The performance of the model was greatly affected by the volume and variety of data. The model was able to effectively identify and generalize hand motions thanks to a wide and diverse dataset. Strong learning was made possible by the addition of a variety of examples, which enhanced model performance in various gestural and environmental circumstances.

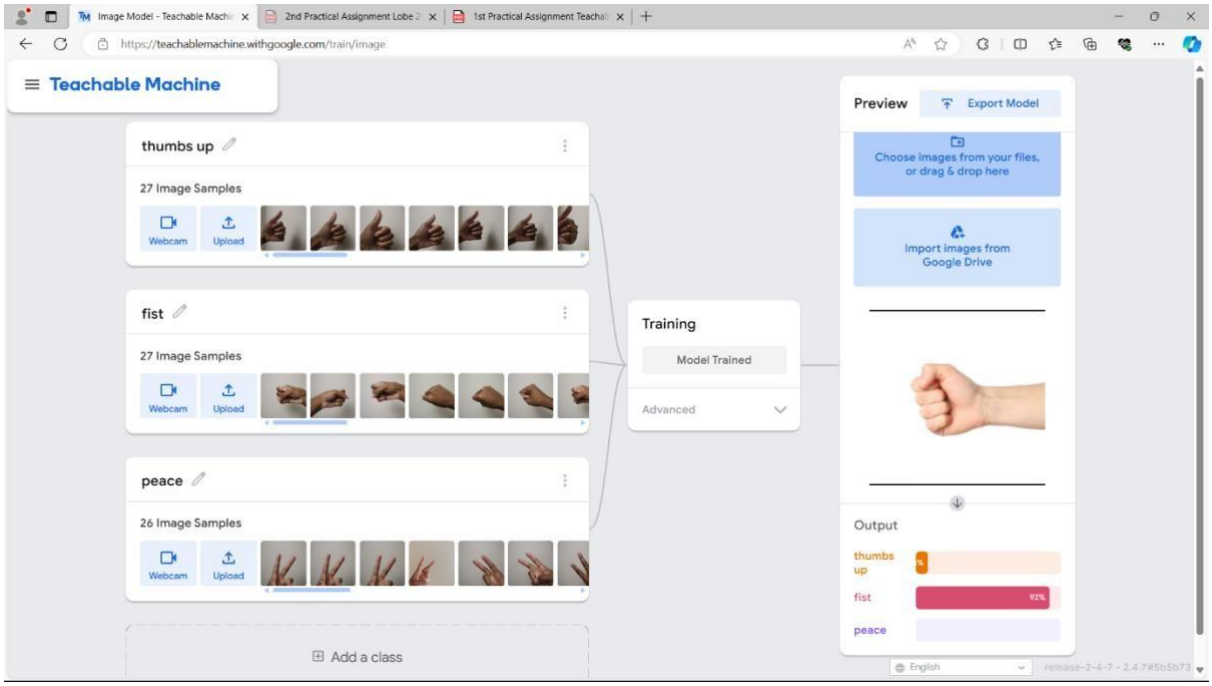
Teachable Machine Experience

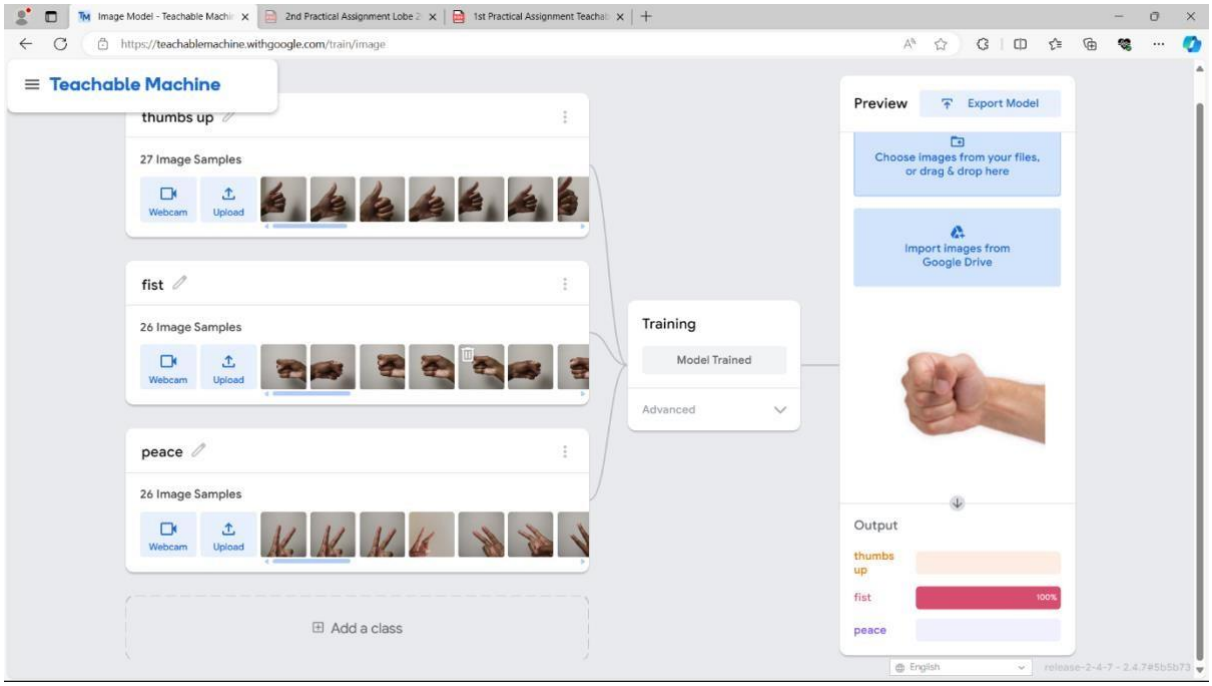
A user-friendly framework for creating a hand gesture detection model was made available by Teachable Machine. The user-friendly interface made it possible to quickly experiment with various classes and motions. The visual feedback provided during model training was helpful in comprehending the behavior of the model, and the drag-and-drop feature made training easier.

One of the platform's drawbacks was the absence of sophisticated customization choices for customers with deeper knowledge of machine learning. Furthermore, the model's flexibility to certain use cases was hampered by the inability to fine-tune several parameters. Teachable Machine is nevertheless a useful resource for novices and anyone looking for a simple method for developing machine learning models, even with these drawbacks.



Using different hand gestures to assess the accuracy of the model caused some issues because the model was confusing the thumbs up with the fist. I collected several images or data with different background to check the accuracy of the model.

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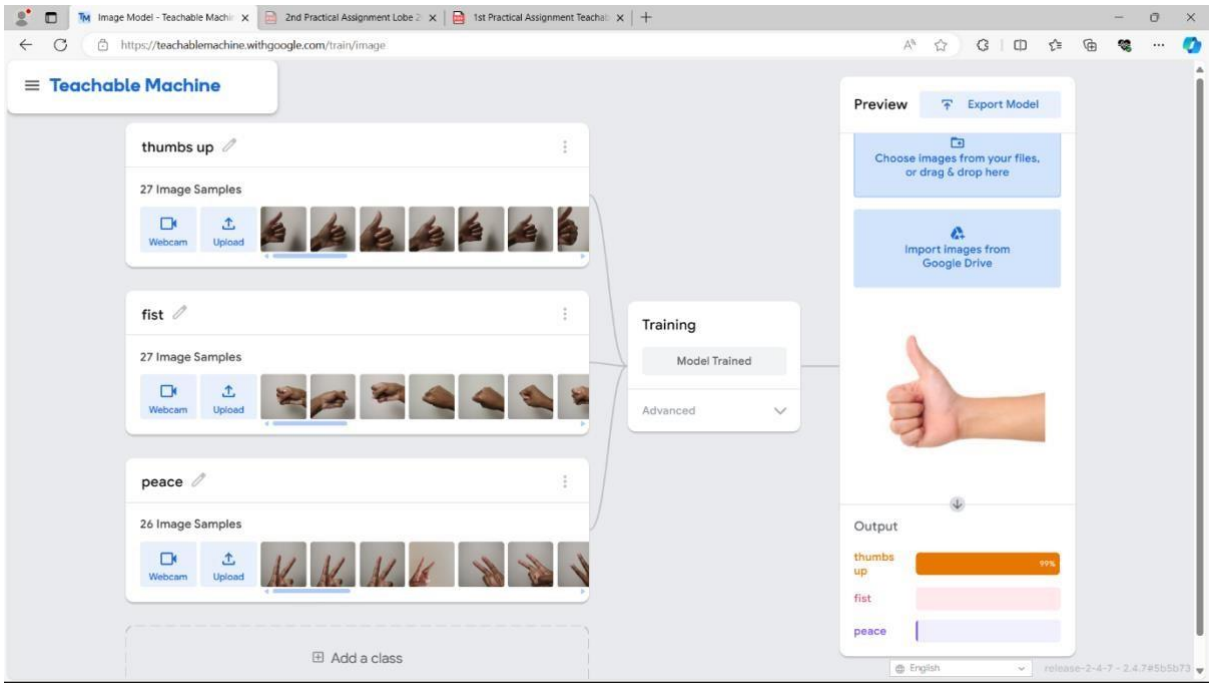
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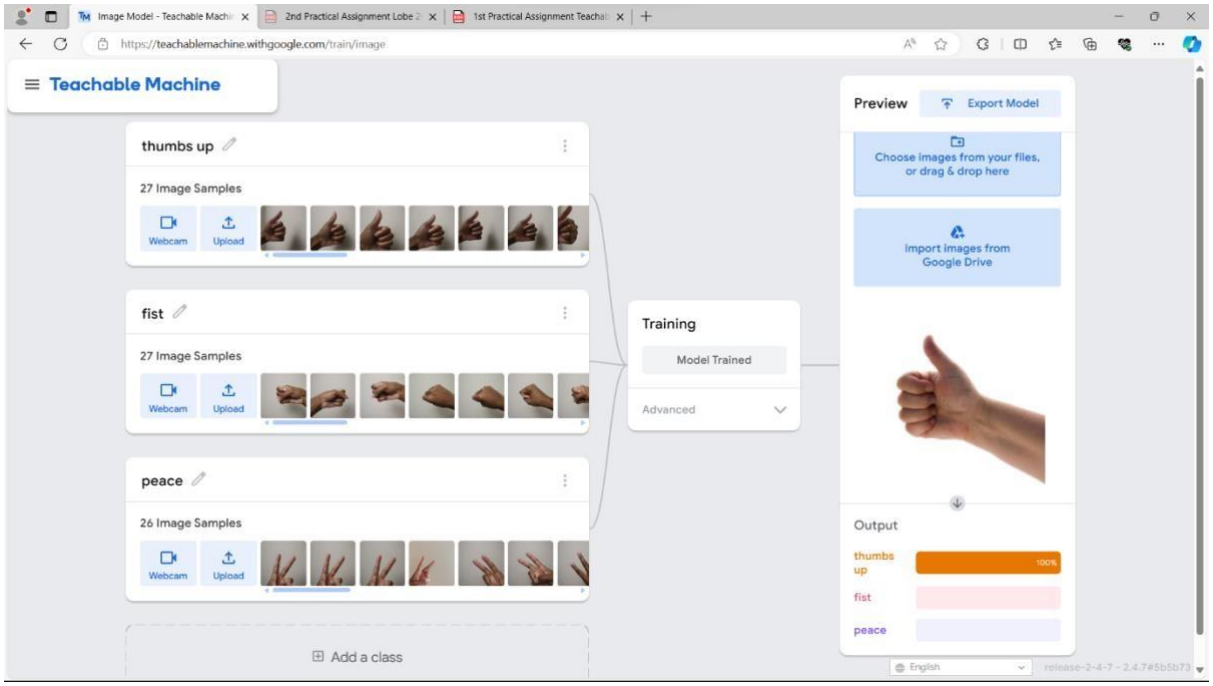

For those looking for a simple and convenient environment to construct machine learning models, Teachable Machine is still a useful resource despite these difficulties.

Learnings and Applications

What I've learnt is that when constructing a model, you must test it with various data sets to determine its accuracy because your model may only function with the data that you've collected, thus you must collect as much data as possible to demonstrate accuracy.

This project provided insightful knowledge on data collection and machine learning. It became clear how crucial a varied and carefully selected dataset was to build a reliable and accurate model. Knowing how data quality affects model performance brought to light how important careful data collection and preprocessing are.

There may be uses for the trained hand gesture recognition model in both private and business contexts. In a private context, the model might be incorporated into smart home systems to recognize hand movements and operate lighting, appliances, or music. Professionally, the approach can be useful in fields like manufacturing or healthcare where hands-free communication is essential. Teachable Machine is a platform that is easily understood by people with different levels of technical competence.

Reference https://teachablemachine.withgoogle.com/models/xQhd_8BH9/