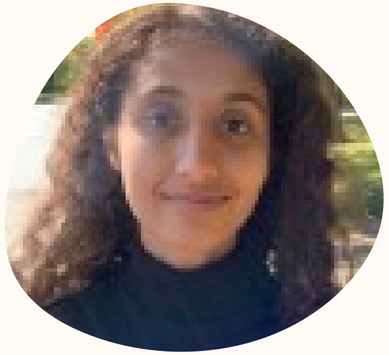
Project Walkthrough

About Us

Bahar Chidem
Software Eng Specialist
@UOFT

Vaibhav Lakshmi Santhanam
Software Eng Specialist
@UOFT



Tara Jorjani
Software Eng Specialist
@UOFT

Arina Azmi
Information Systems Specialist
@UOFT

Traffic Signs

designing a multi-class, single image classification model of traffic signs

problem statement

Thousands of car crashes occur annually in Canada, with 94% of them resulting from human error.

With the advent of self-driving vehicles in the planning phase, a high accuracy of traffic sign identification can speed up the autonomous-driving process and reduce collisions.

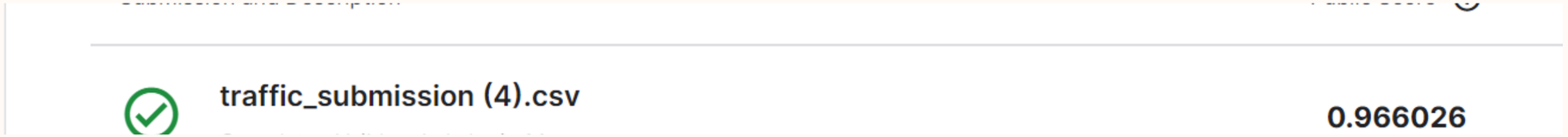
Solution

Our Traffic Sign identification model addresses this problem by using a multi-class, single image identification of several signs.
A short description of the model

- A Convolutional Neural Network (CNN) is designed to classify traffic sign images into distinct categories.
- Images are preprocessed to uniform size and format, ensuring consistency for neural network input.
- Data augmentation techniques like rotation and zoom are applied to improve the model's robustness and ability to generalize.
- The CNN architecture includes convolutional, pooling, and dense layers, tailored to extract and learn features from traffic sign images.
- The model is trained and validated on a labeled dataset of traffic signs, using techniques like early stopping and learning rate adjustments to optimize performance.

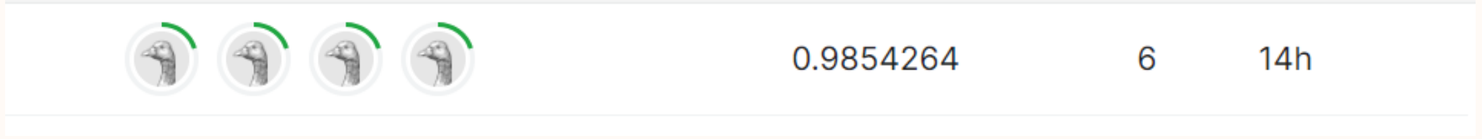
Outputs of running our model on version one (traffic signal)

id	output
0	16
1	1
2	38
3	33
4	11
5	38
6	18
7	12
8	25
9	35
10	12
11	7
12	23
13	7



Outputs of running our model on version two (trafficwithmoreepoch)

```
id,output
0,16
1,1
2,38
3,33
4,11
5,38
6,18
7,12
8,25
9,35
10,12
11,7
12,23
13,7
14,4
15,9
16,21
17,20
```



Version 1

the code was trained on an epoch of 20

Version 2

the code was trained on an epoch of 25 increased the duration of training

References:

https://www.datacamp.com/tutorial/complete-guide-data-augmentation

https://towardsdatascience.com/traffic-sign-detection-using-convolutional-neural-network-660fb32fe90e

https://www.analyticsvidhya.com/blog/2021/12/traffic-signs-recognition-using-cnn-and-keras-in-python/

Thank you