

Car Color Classification Neural Net

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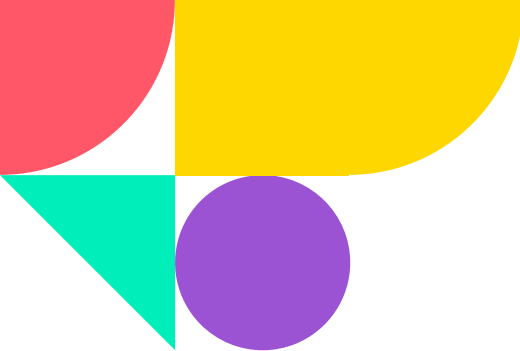
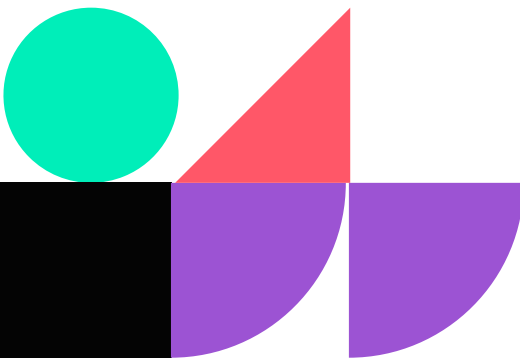


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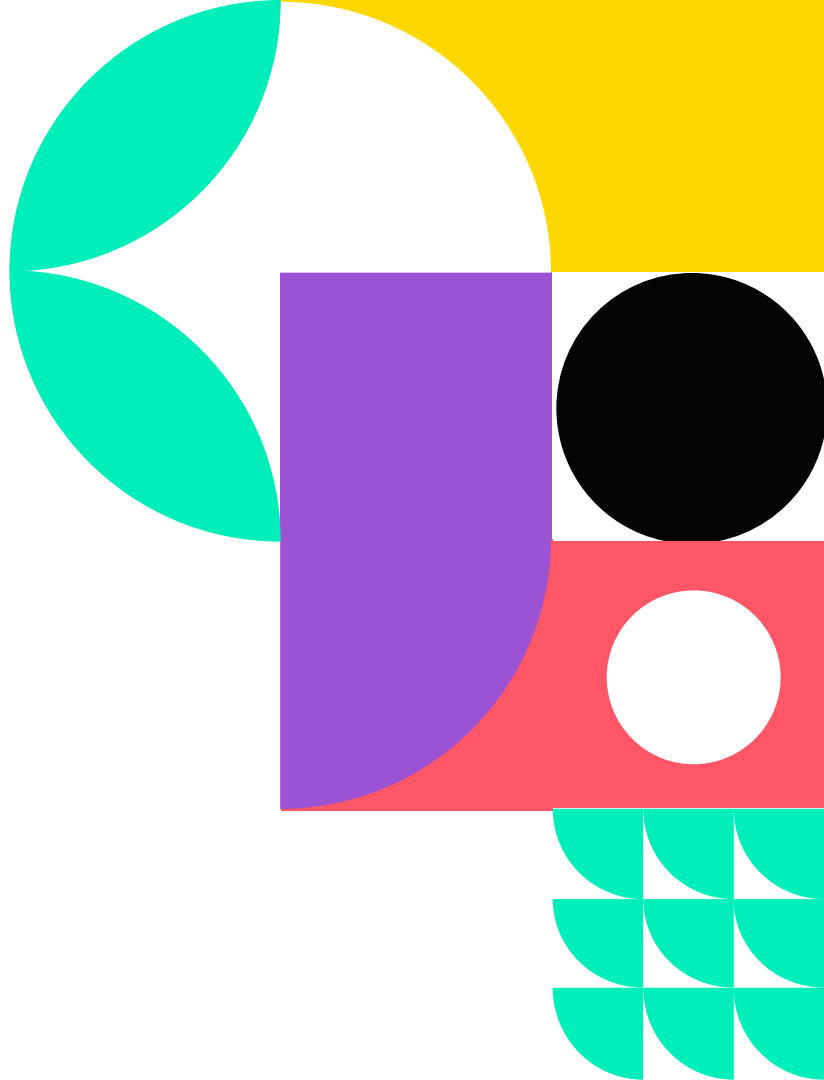
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Results & Future Steps

01

Colors



What color is this car?



What color is this car?



What color are these cars?



Background

Determining paint color is difficult...

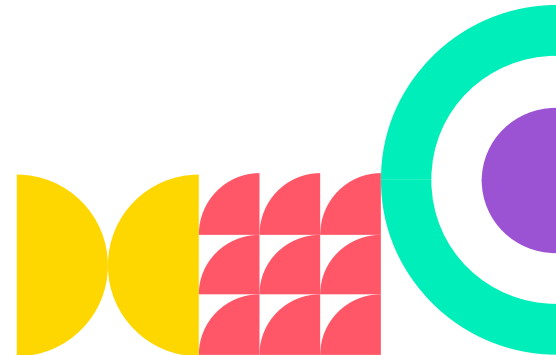
Neural Network models can be trained to recognize color.

Image classification models are used in:

- ITS (Intelligent Traffic Systems)
- Tesla Autopilot
- This capstone project!

Color is
“steamed
milk” white!

NN

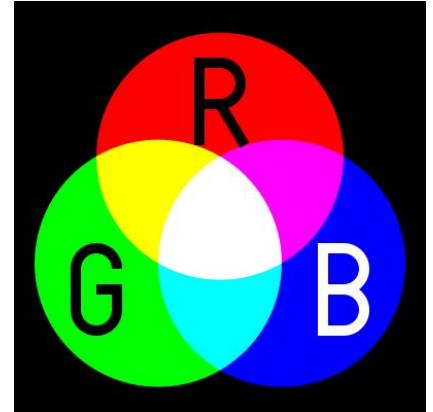


How can we convert visual paint into digital data?



An abstract geometric composition featuring a grid of various shapes and colors. The top row includes a yellow rounded rectangle, a purple rectangle, a black semi-circle, and a white rounded rectangle. The middle row consists of a pink rectangle, a white rounded rectangle, and a cyan semi-circle. The bottom row features a yellow square with four black leaf-like shapes, a black rounded rectangle with a pink semi-circle, and a yellow triangle. A large black circle with a pink ring is positioned in the bottom left corner.

(0,0,0) to
(255,255,255)





02

Methodology

Where's the Data?

01

Cars

~16,000 images of cars:
~8,000 for train
~8,000 for test

02

Colors

>200 colors with RGB
values

ColorThief Categorizing Data



Dominant Color



Palette



Ghost (196,195,208)



Dominant Color



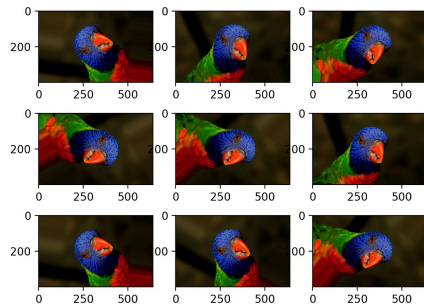
Palette



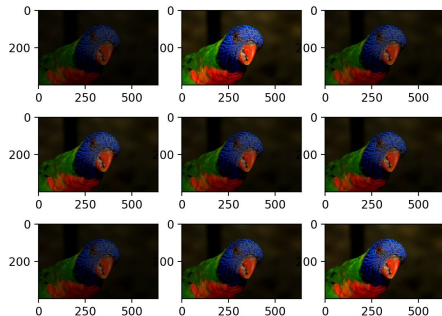
Persimmon (236,88,0)

Image Augmentation

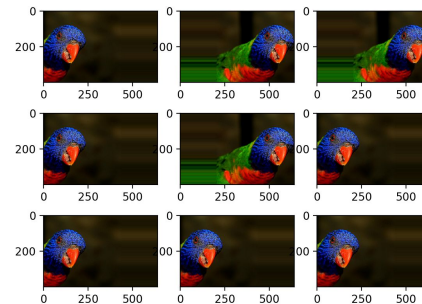
Rotation



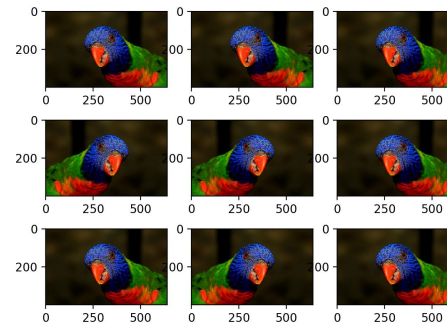
Brightness



Shift



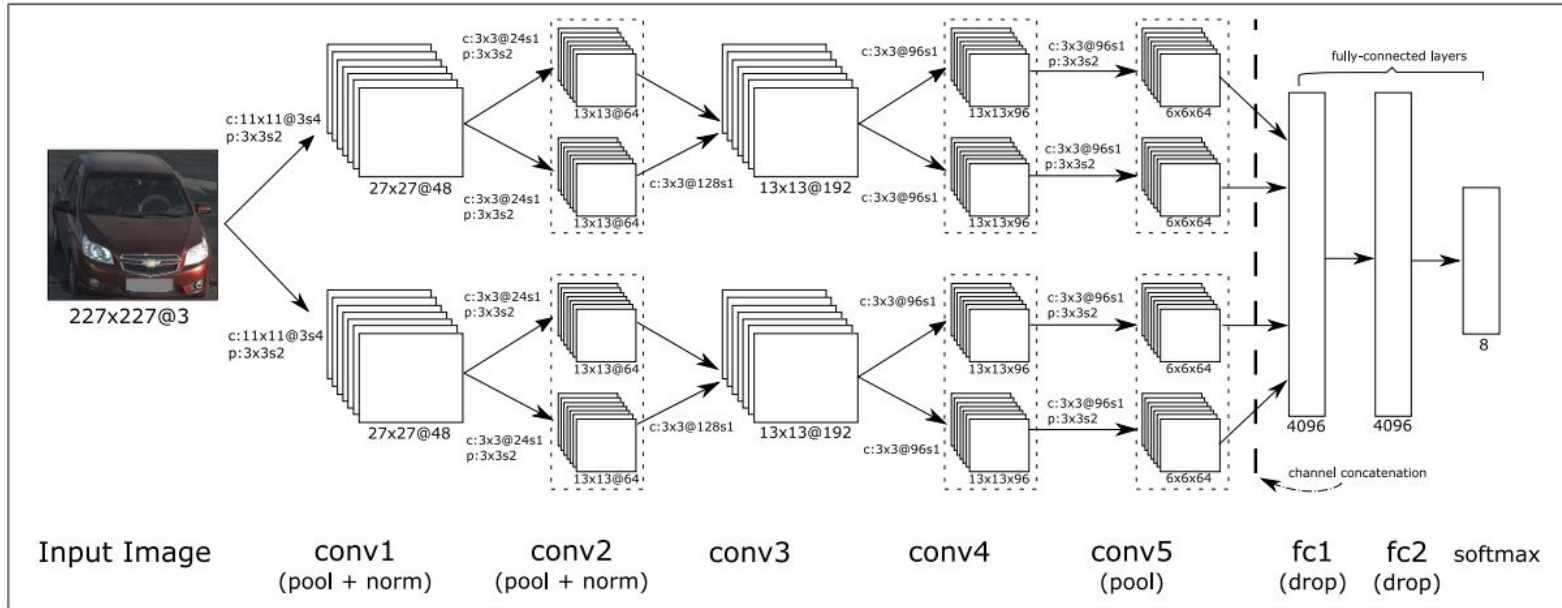
Flip



Convolutional Neural Network

CNN's are popular for image classification.

Model Architecture based off original work by Reza Fuad Rachmadi and I Ketut Eddy Purnama. <https://arxiv.org/pdf/1510.07391.pdf>

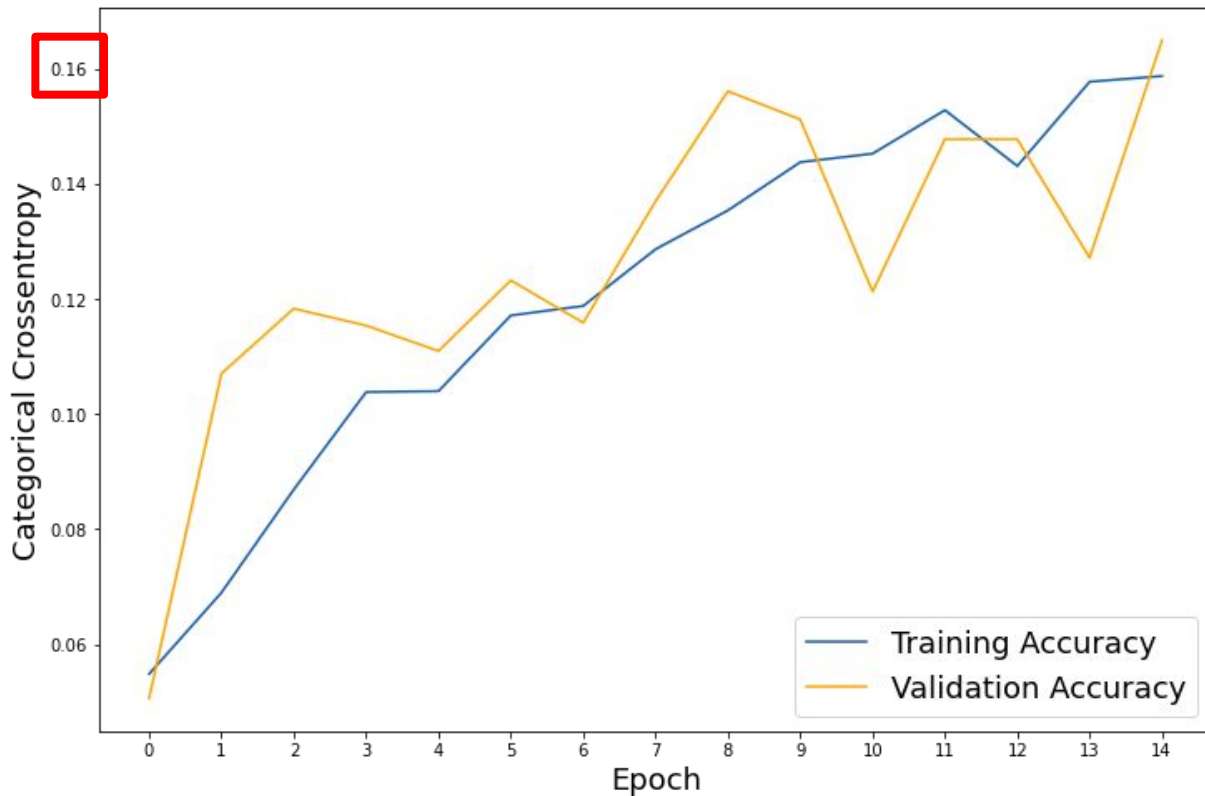


03

Conclusions



Accuracy Results



Validation Accuracy:
0.168

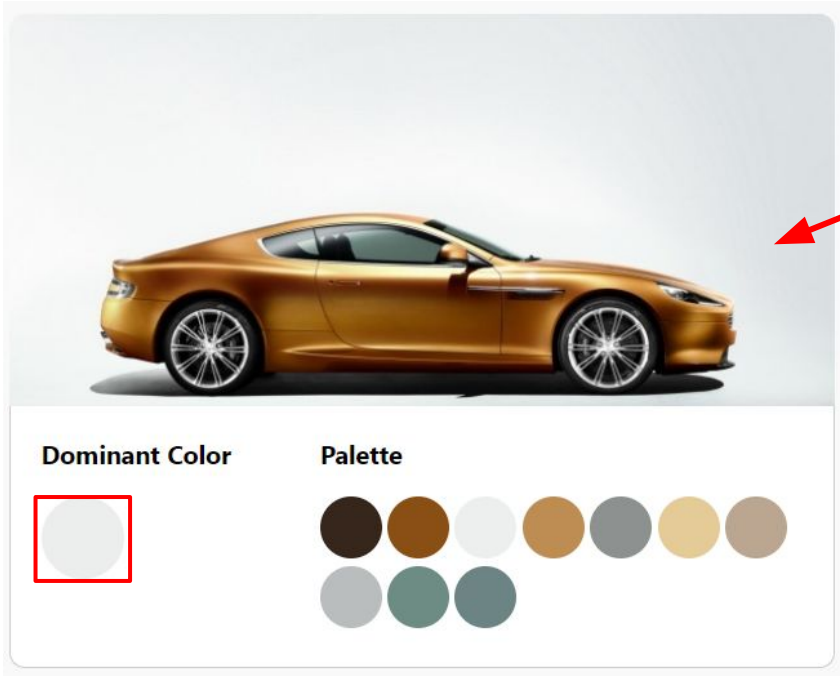
Prediction Accuracy:
0.008

Baseline Accuracy:
0.005

What happened?



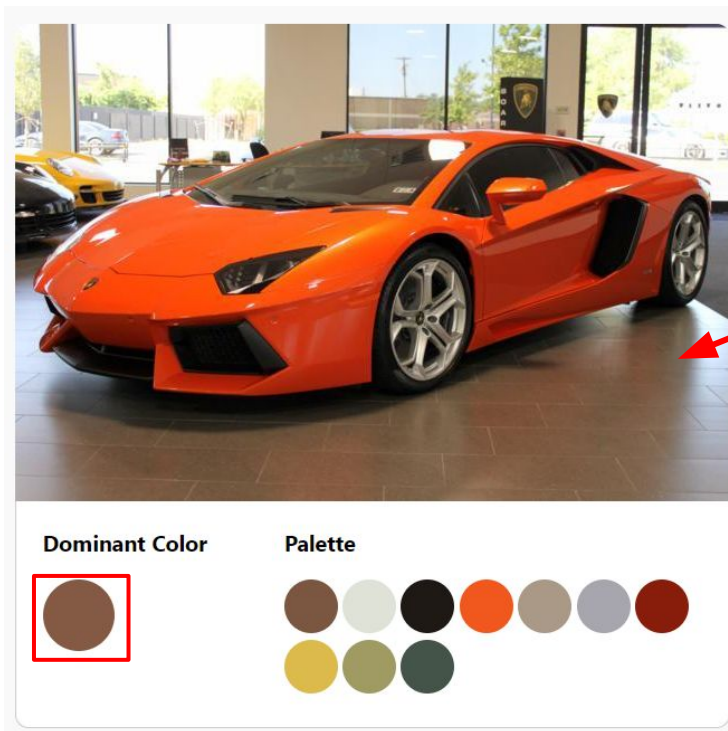
What went wrong: ColorThief



ColorThief:
Isabelline
(244,240,236)

Prediction:
Isabelline
(244,240,236)

What went wrong: ColorThief

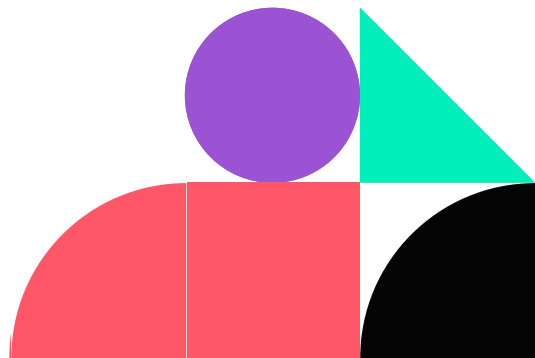


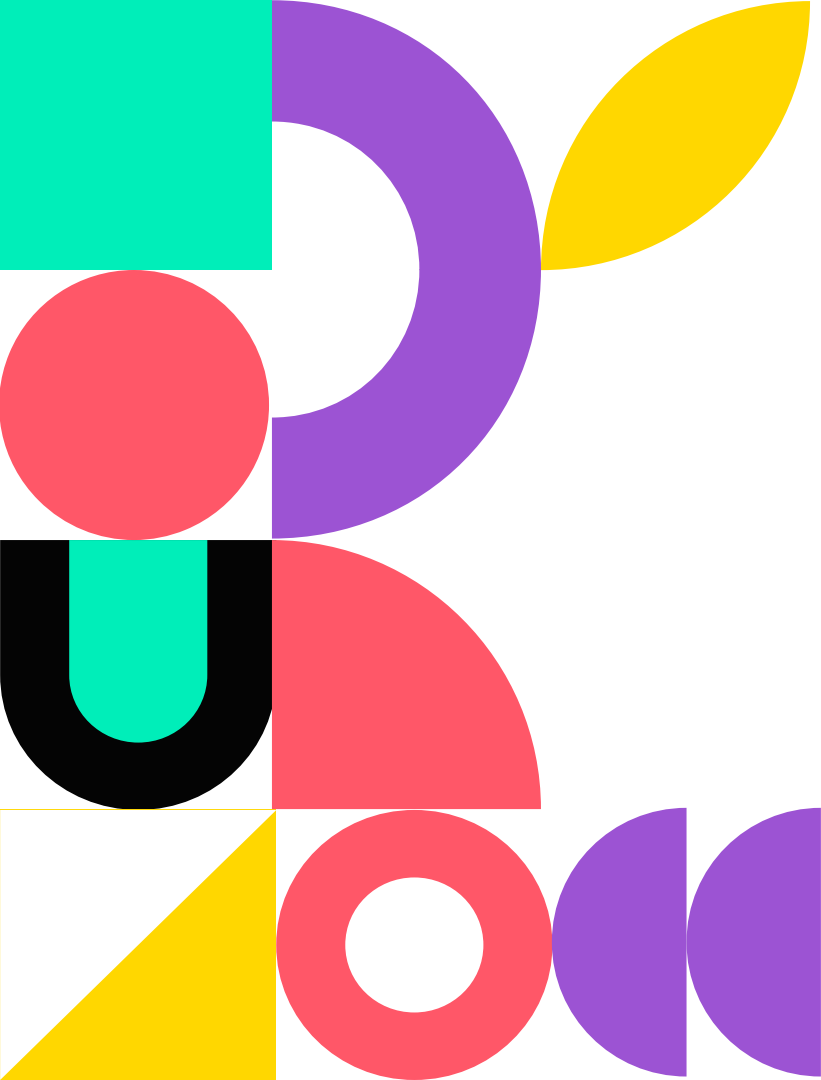
ColorThief:
Raw Umber
(130,102,68)

Prediction:
Opera Muave
(183,132,167)

- Reduce number of classes.
- Better pre-process data to reduce noise.
- More image augmentation.
- Replace RGB with other color models (HSV).

Areas for Improvement





Questions?

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