

Projet 6milarite

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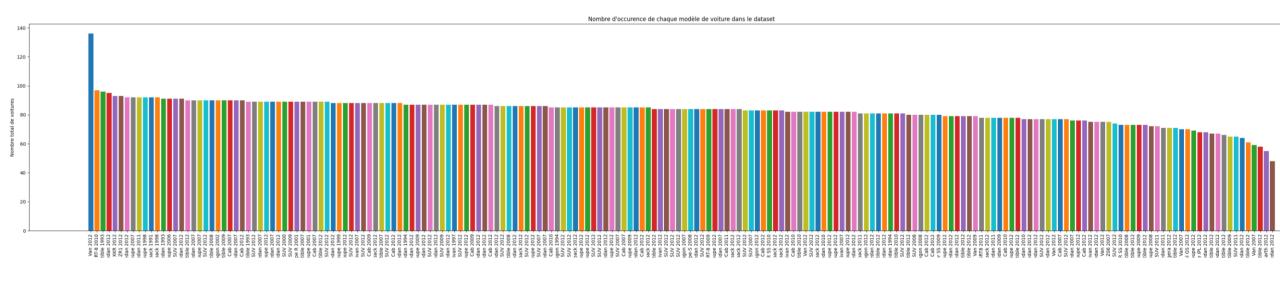
25 avril 2024



Introduction



Dataset

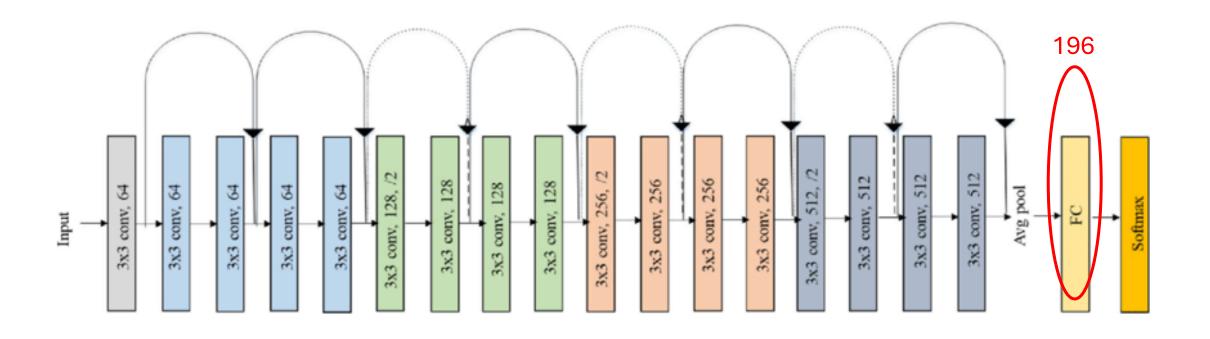






16k voitures 196 modèles différents

Model: Resnet18





Pré-traitement



HorizontalFlip

Original

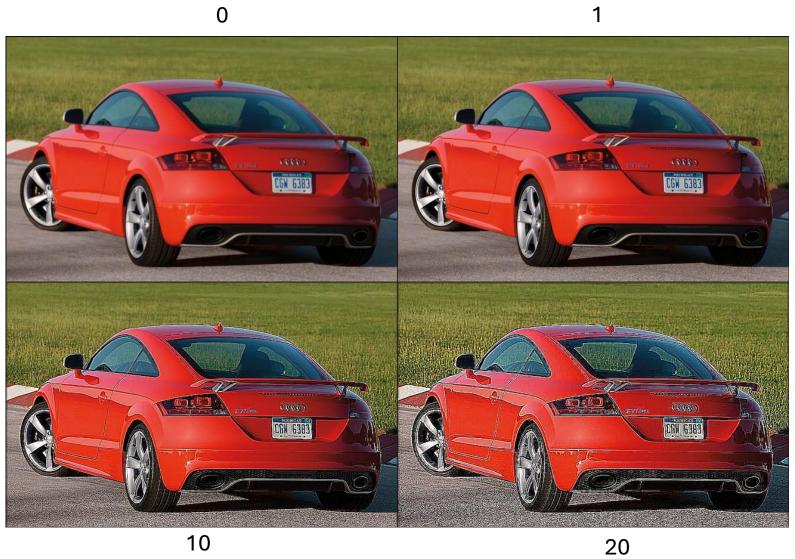


Horizontal flip



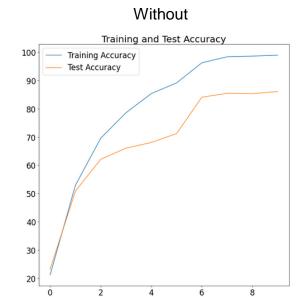


AdjustSharpness

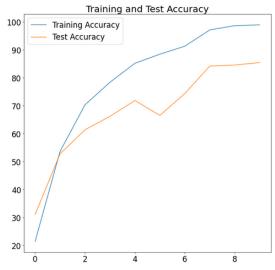




AdjustSharpness



RandomAdjustSharpness(2)



RandomAdjustSharpness(10)

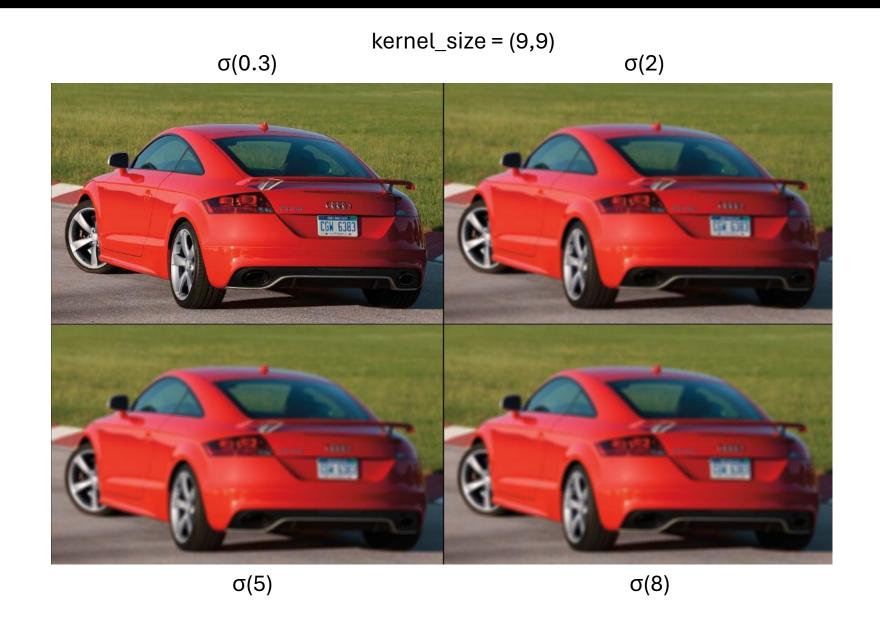


RandomAdjustSharpness(20)



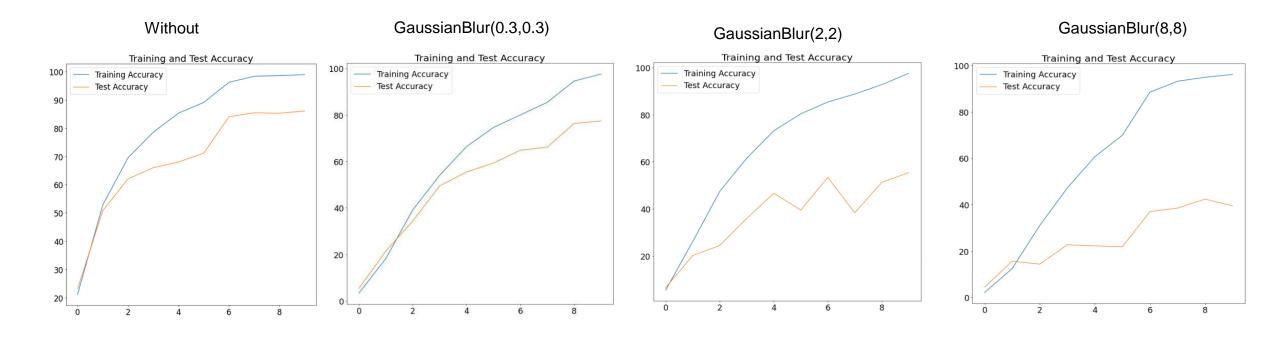


GaussianBlur



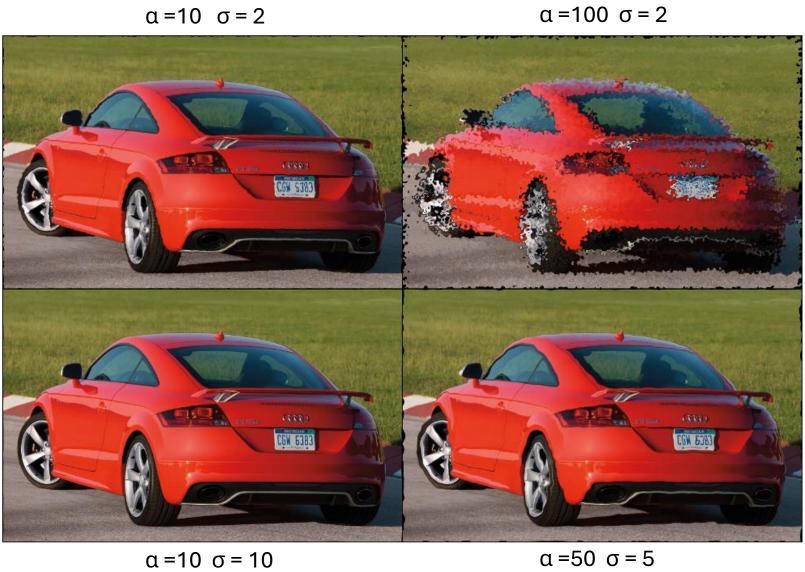


GaussianBlur





ElasticTransformation



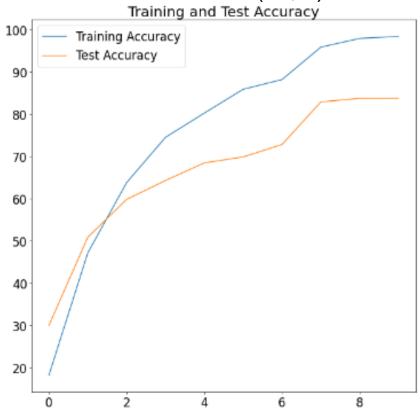


 $\alpha = 50 \sigma = 5$

ElasticTransformation



ElasticTransform(50, 5)





ColorJitter

brightness=0.2, contrast=0.2, saturation=0.2, hue=0.1

brightness=0.2, contrast=0.7, saturation=0.4, hue=0.2

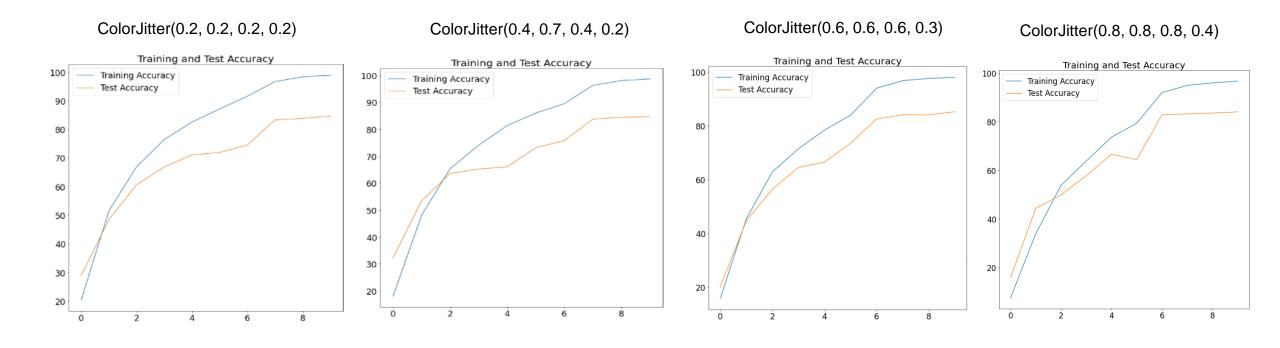


brightness=0.6, contrast=0.6, saturation=0.6, hue=0.3

brightness=0.8, contrast=0.8, saturation=0.8, hue=0.4



ColorJitter





Hyperparamètres et entraînement

Batch_size 32 →16 = gain de temps

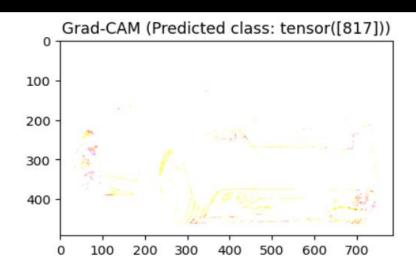
num_worker $2 \rightarrow 4 = gain de temps$

Epochs 10 → 15 = meilleures performances

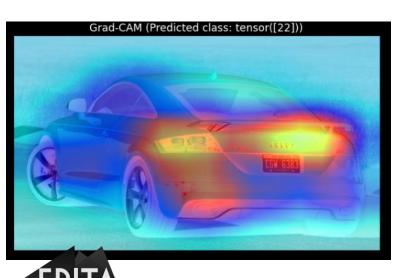


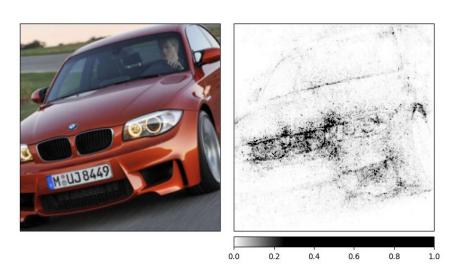
Grad-CAM et analyse des résultats













Analyse des résultats

Influence de la répartition des train/test datasets



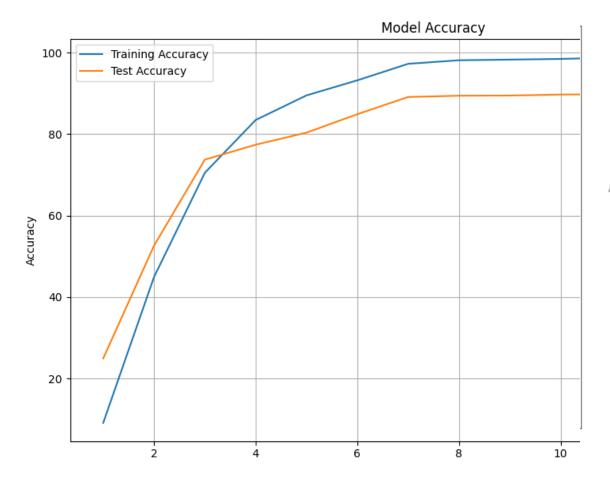




50% train50% test

70% train 30% test

Analyse des résultats



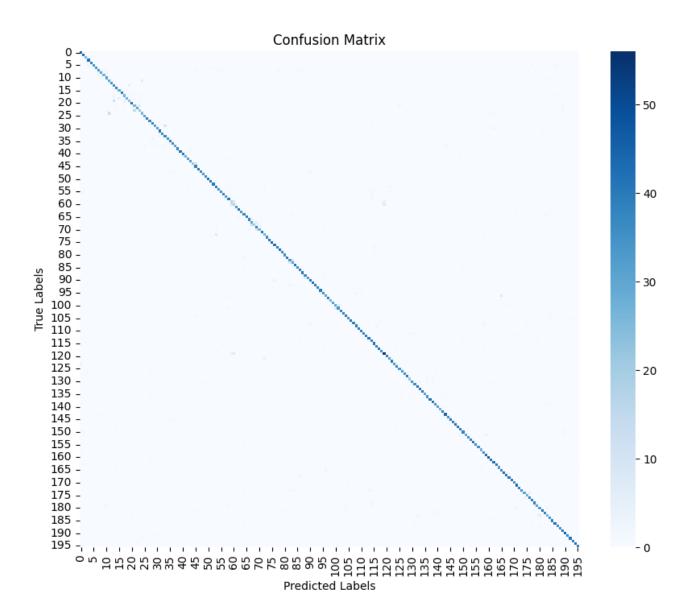
		precision	recall	f1-score	support
AM General Hummer SUV	2000	0.75	0.94	0.83	16
Acura RL Sedan	2012	0.80	0.73	0.76	11
Acura TL Sedan	2012	0.81	1.00	0.89	17
Acura TL Type-S	2008	0.81	0.87	0.84	15
Acura TSX Sedan	2012	0.96	0.76	0.85	29
Acura Integra Type R	2001	0.87	0.91	0.89	22
Acura ZDX Hatchback	2012	0.93	0.93	0.93	14
Aston Martin V8 Vantage Convertible	2012	0.67	0.67	0.67	18
Aston Martin V8 Vantage Coupe	2012	0.70	0.93	0.80	15
Aston Martin Virage Convertible	2012	0.60	0.69	0.64	13
Aston Martin Virage Coupe	2012	0.92	0.69	0.79	16
Audi RS 4 Convertible	2008	0.79	0.79	0.79	19

Accuracy: 86%

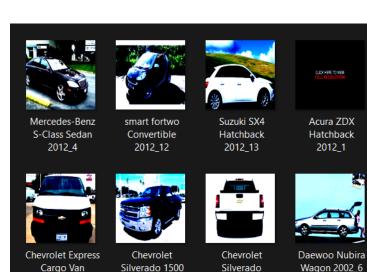
Loss: 0.03



Matrice de confusion











Wagon 2012_12

Aston Martin V8

Vantage Coupe

2012_8



Cargo Van

2009_7

Aston Martin

Virage Coupe

2012_8



Duty Crew Cab

2012_6

Audi A5 Coupe

2012_1



Minivan 2007_0

Audi A5 Coupe

2012_2



Coupe 2012_4

Audi A5 Coupe

2012_7



Crew Cab 2010_2

Audi A5 Coupe

2012_10

Superlegger...



2012_5

BMW 1 Series

Convertible

2012_4

2012_1



Chevrolet

Corvette Ron

Fellows Edition

Z06 2007_7

2012_14



2007_5





2500HD Regular

Cab 2012_6



1994_0





2012_11

















Van Minivan

2012_13

Regular Cab

2012_9

Volkswagen Golf Hatchback 2012_3



Audi 100 Wagon 1994_1

Audi S4 Sedan

BMW M3 Coupe Bentley Continental Flying Spur Sedan 2007_5

Chevrolet Camaro Convertible 2012_3

Chevrolet Express Cargo Van 2007_11

Chevrolet Impala **Chevrolet Monte** Sedan 2007_6 Carlo Coupe 2007_3



Chrysler Town and Country Minivan 2012_2



Ferrari 458 Italia Convertible 2012_7



Fisker Karma Sedan 2012_6



GMC Savana Van 2012_5



Jaguar XK XKR 2012_6



Land Rover Range Rover SUV 2012_13



Mercedes-Benz 300-Class Convertible



2012_10

MINI Cooper Roadster Convertible



Nissan 240SX Coupe 1998_12



Rolls-Royce Phantom Sedan 2012_11



Spyker C8 Convertible 2009_12



Spyker C8 Coupe 2009_5







Bentley Continental GT Coupe 2012



['Volkswagen Beetle Hatchback 2012'] confidence: 5.346620559692383



Volkswagen Beetle Hatchback 2012















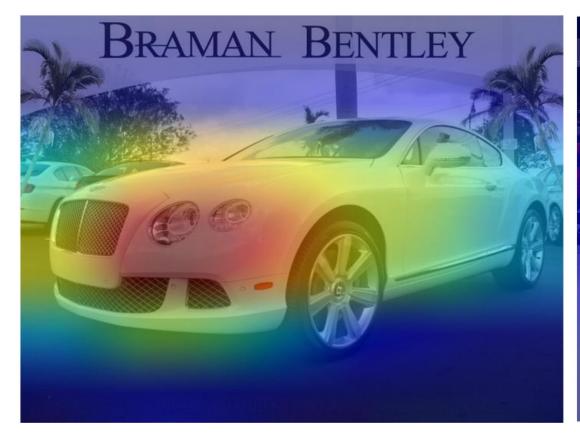








Bentley Continental GT Coupe 2012



Volkswagen Beetle Hatchback 2012





Difficultés recontrées

- Stabilité des plateformes insuffisantes pour nos entrainements

 Manque de temps pour l'implementation de futures améliorations

- Obtention de meilleurs résultats sur un prétraitement incohérent d'images (resize)



Conclusion



Conclusion

Augmentation du dataset

~80 -> 200 images par modèle

16k -> 40k total

GradCAM

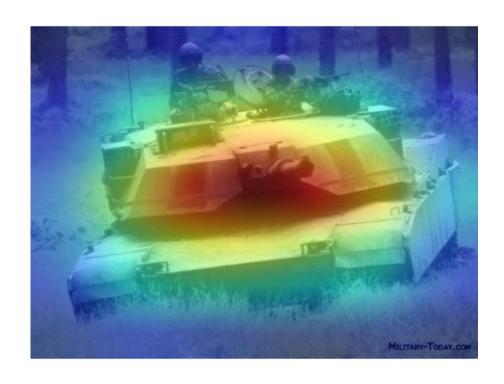
Flouter les zones des prédictions défectueuses

Interprétation des performances

- Recall
- F1 score



Ouverture







Questions

