ADVANCED MACHINE LEARNING

Project Work on the
Fruits 360 Challenge

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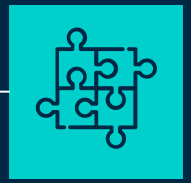
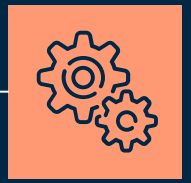


01

PROBLEM STATEMENT

Describing the dataset



02

OUR SOLUTIONS

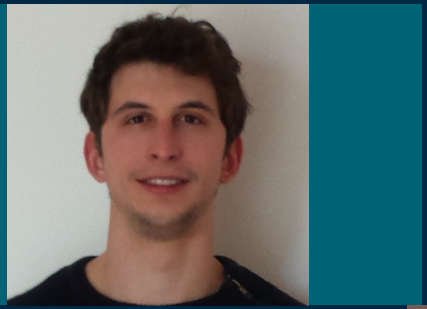
Transfer learning and custom models

03

RESULTS

Results and possible imporvements

OUR TEAM



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- Bachelor Degree in Physics
- Currently student of Master Degree in Data Science

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- Bachelor Degree in Computer Science
- Master degree student in Computer Science

PROBLEM STATEMENT

01

UNDERSTANDING THE PROBLEM

COMPUTER VISON

Building a machine capable of working with image and video data.

IMAGE CLASSIFICATION

Must categories non-structured data (images) into predefined categories

UNDERSTANDING THE PROBLEM

120 balanced classes

100x100 px images with white background

OUR GOALS

TRANSFER LEARNING

Take state of the art CNN from ImageNet and explore their application to our data

BUILDING

Building a custom architecture and compare it to the transferred models

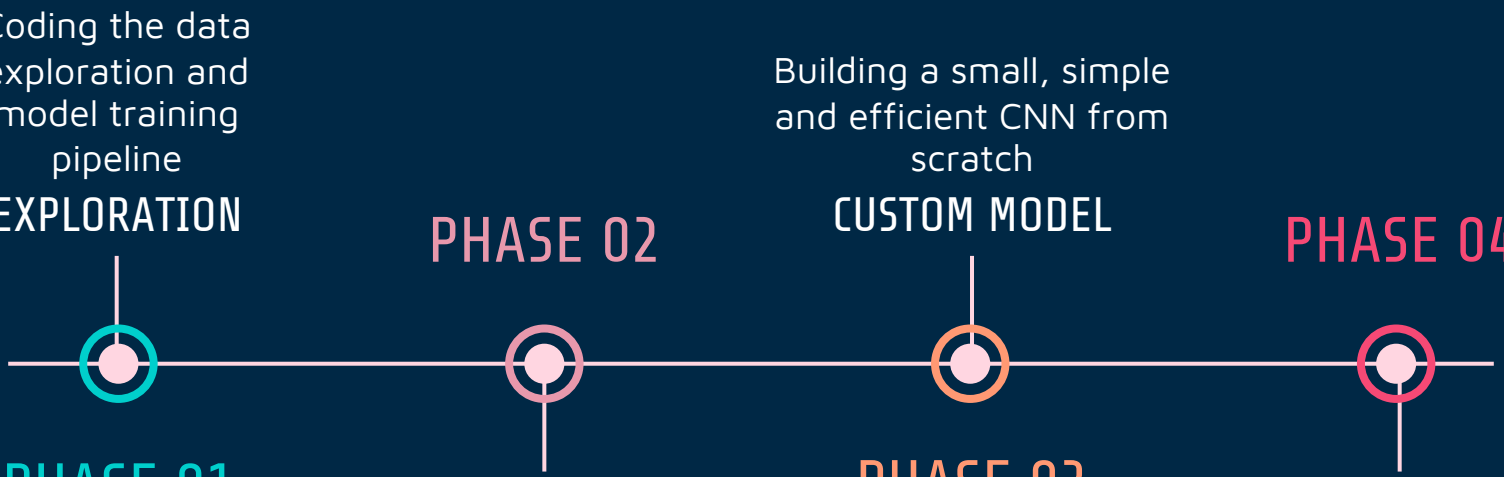
HPO

Make a principled choice of the hyperparameters and have a firmer ground for model comparison

SOLUTIONS

02

OUR PROCESS


Coding the data exploration and model training pipeline
EXPLORATION
PHASE 01
PHASE 02
TRANSFER LEARNING
Taking high performing competitors from ImageNet and training on our own task
Building a small, simple and efficient CNN from scratch
CUSTOM MODEL
PHASE 03
PHASE 04
HPO
Extracting the best performance out of our models

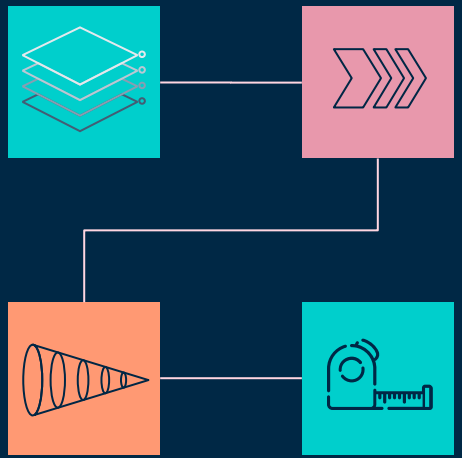
OUR SOLUTIONS

VGG-16

Smaller kernels

RESNET 50

Skip connections



INCPETION V3

Network-in-network

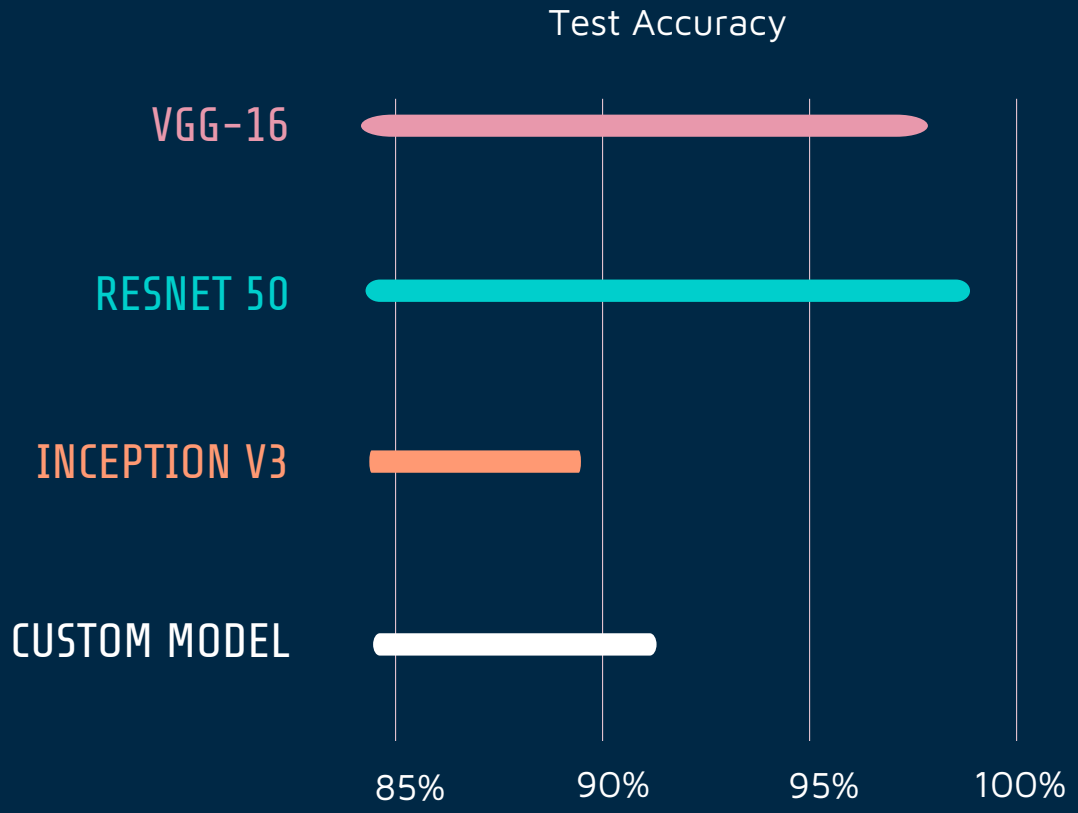
CUSTOM

Ad hoc

HPO

03

RESULTS


Test Accuracy
VGG-16
RESNET 50
INCEPTION V3
CUSTOM MODEL
85%
90%
95%
100%

WRAPPING UP

ENANCHEMENTS

KERAS TUNER

CODE REFACTORING

Free the code form skopt's bugs and perform better HPO on Inception and Custom

NAS

ON CUSTOM

How many conv layers? Better with one or many pooling?

LCP

FASTER HPO

Learning curve prediciton would allow us to avoid spending time on bad configurations

THANKS

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