

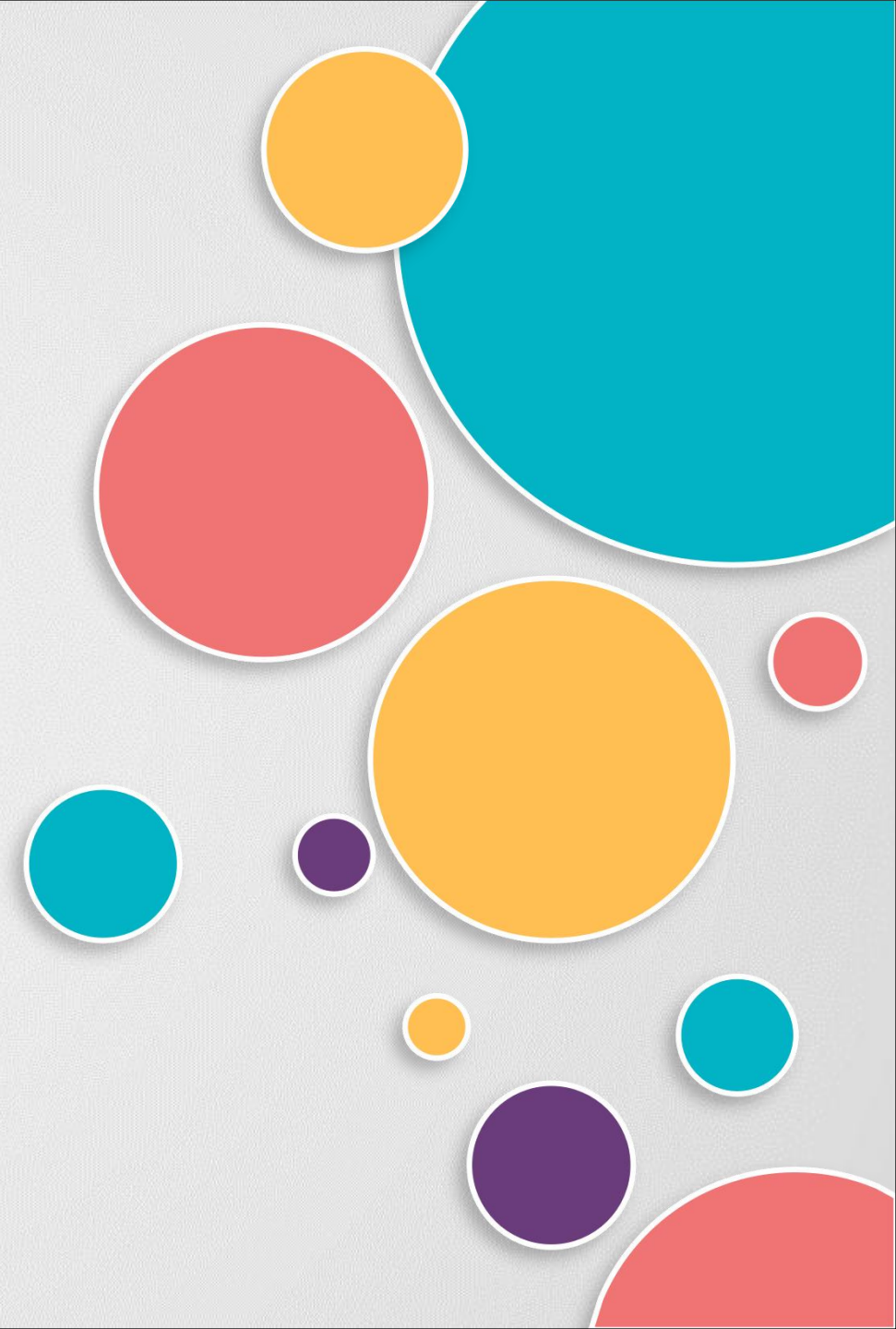
Under the guidance of
D.RAMESH Assistant
P r o f f e s s o r , C S E



Pneumonia and Heart analysis

Through deep learning

T E A M - 2 9



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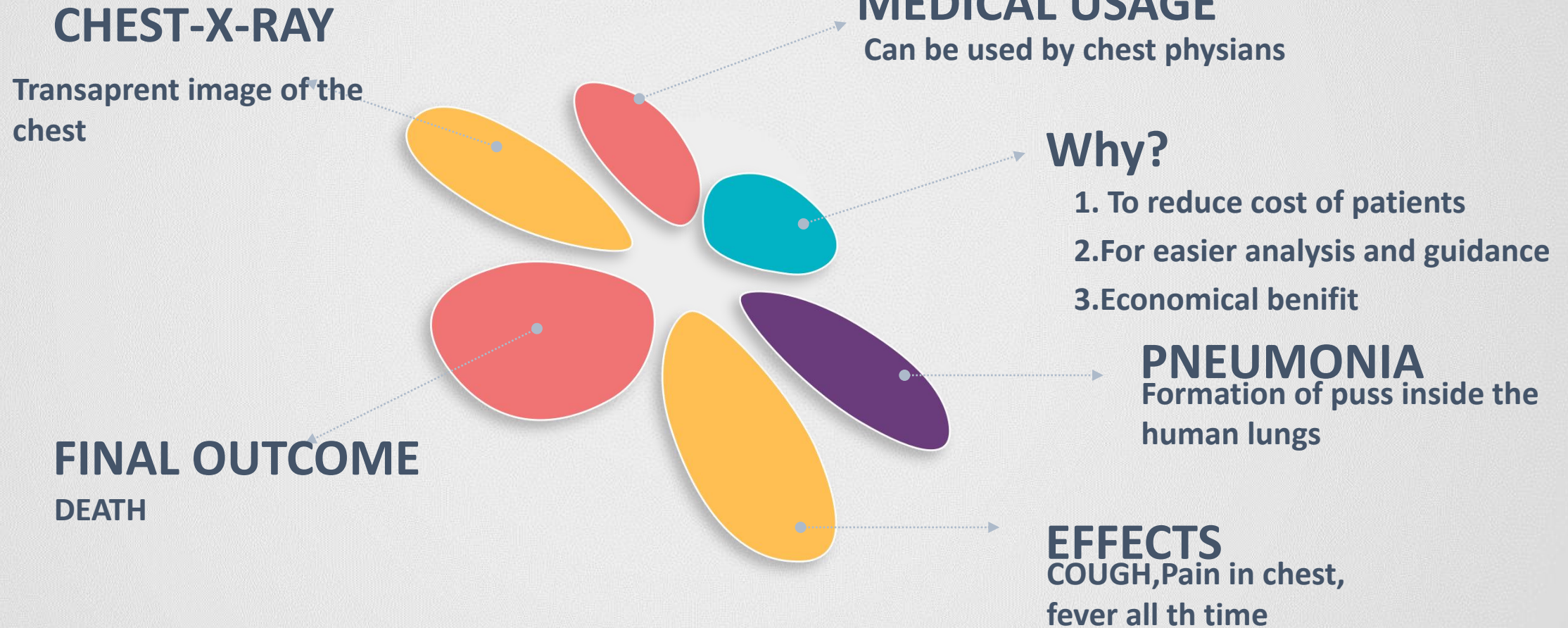
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- MODELS & IMPLEMENTATION
- Result & Output



PART 01

INTRODUCTION



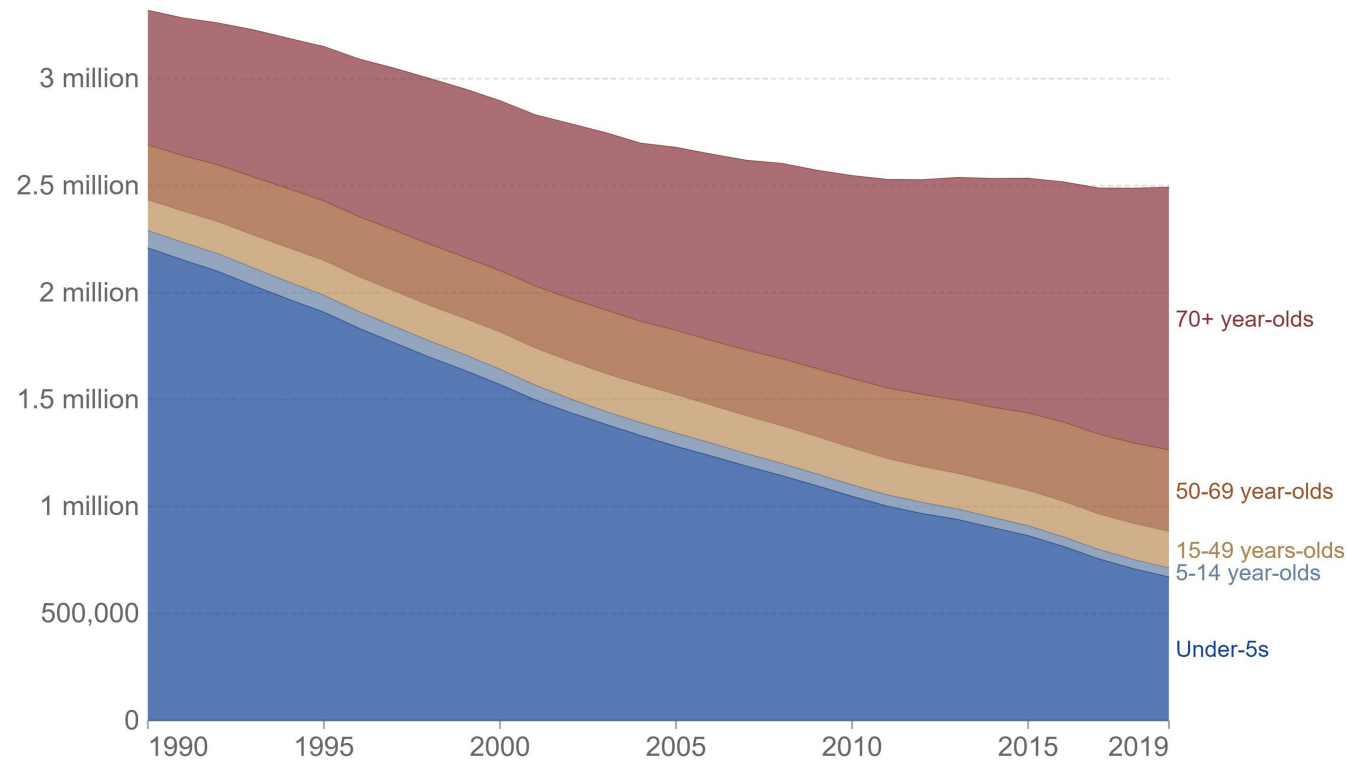
INTRODUCTION



THE PROBLEM

Deaths from pneumonia, by age, World, 1990 to 2019

Our World
in Data



Source: IHME, Global Burden of Disease (2019)

Note: Deaths from 'clinical pneumonia', which refers to a diagnosis based on disease symptoms such as coughing and difficulty breathing and may include other lower respiratory diseases.

OurWorldInData.org/pneumonia • CC BY



DATA

The data suggests the amount of deaths is considerably declined yet it is still an mas problem



MORTALITY RATE

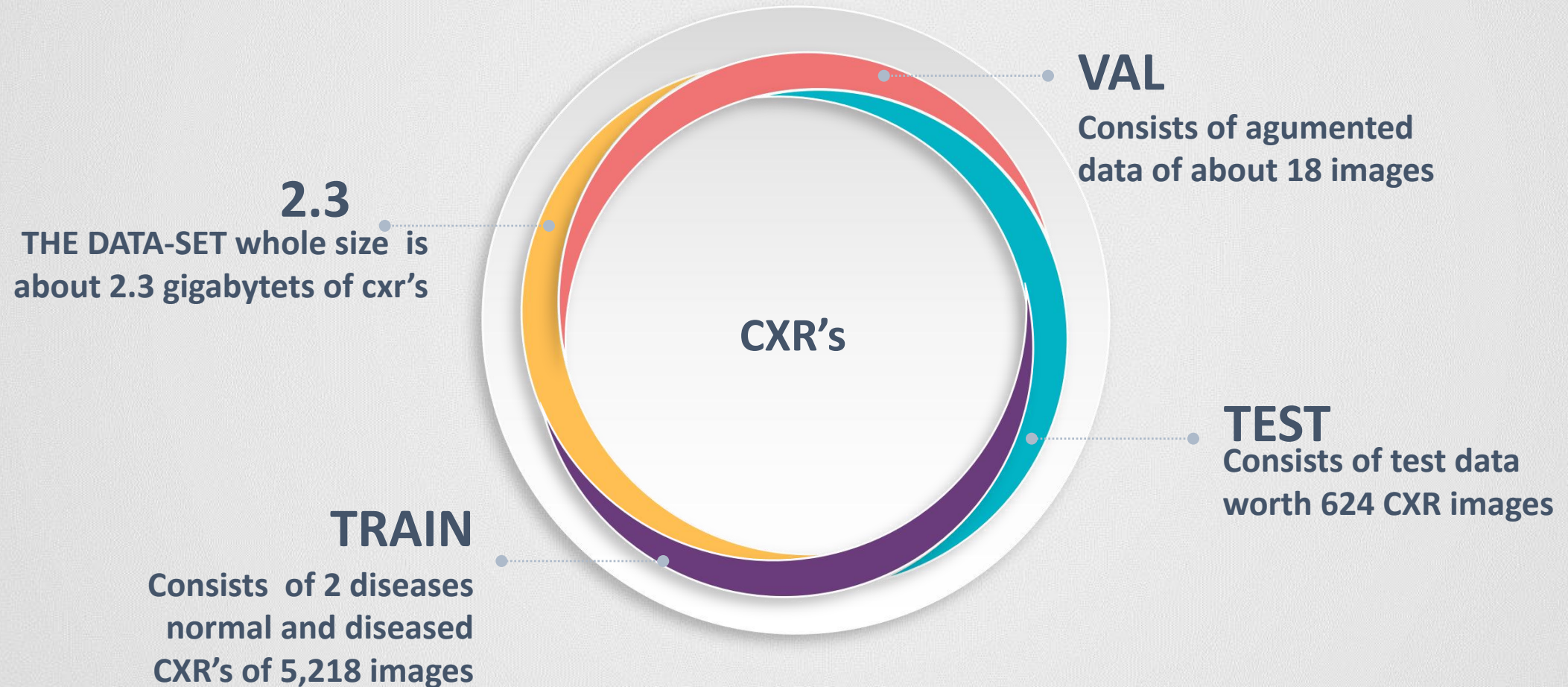


In Need of Effective diagnosis

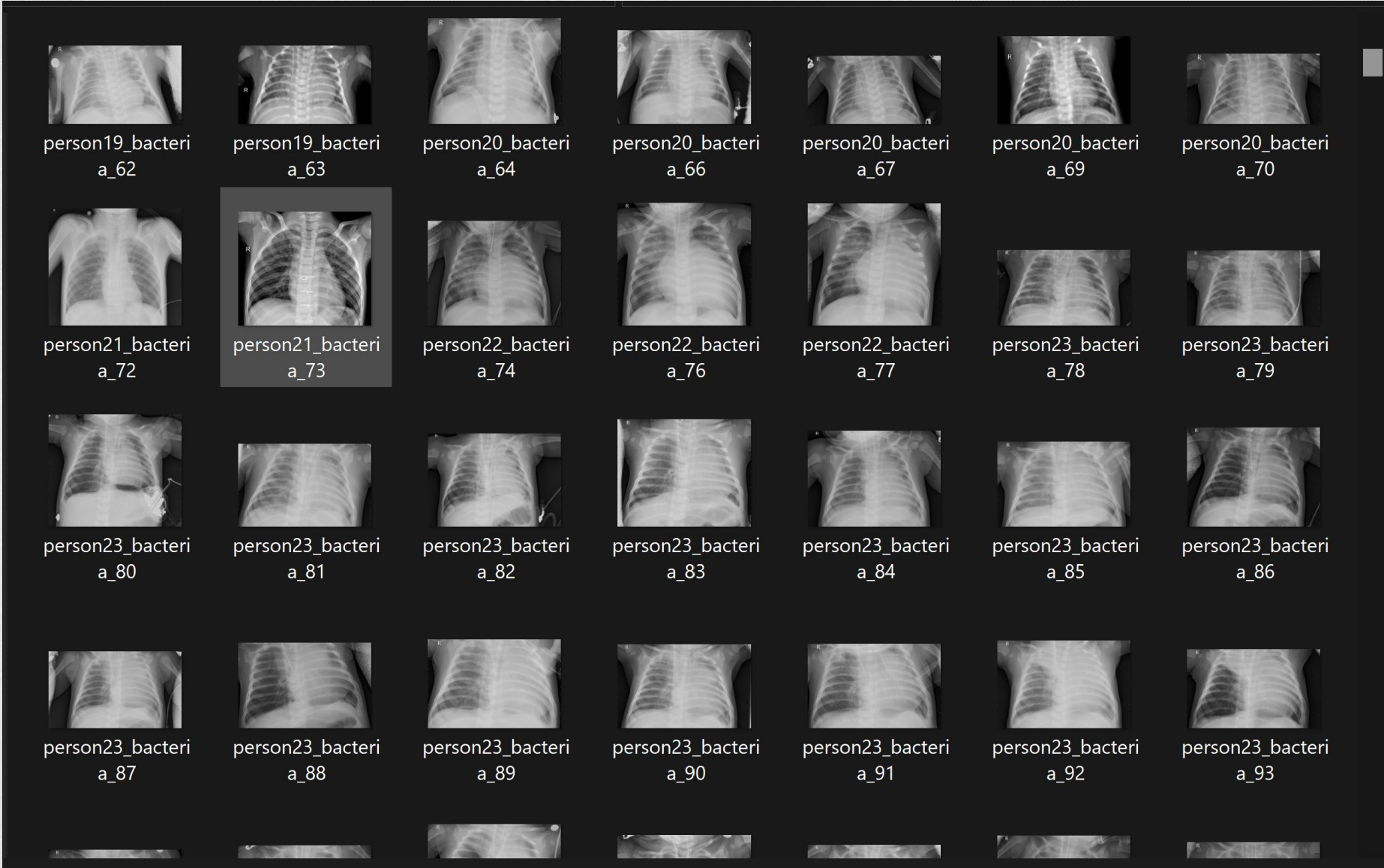


PART 02

DATA-SET Details



DATA-SET INSIGHTS



CHALLENGES WITH THE DATASET



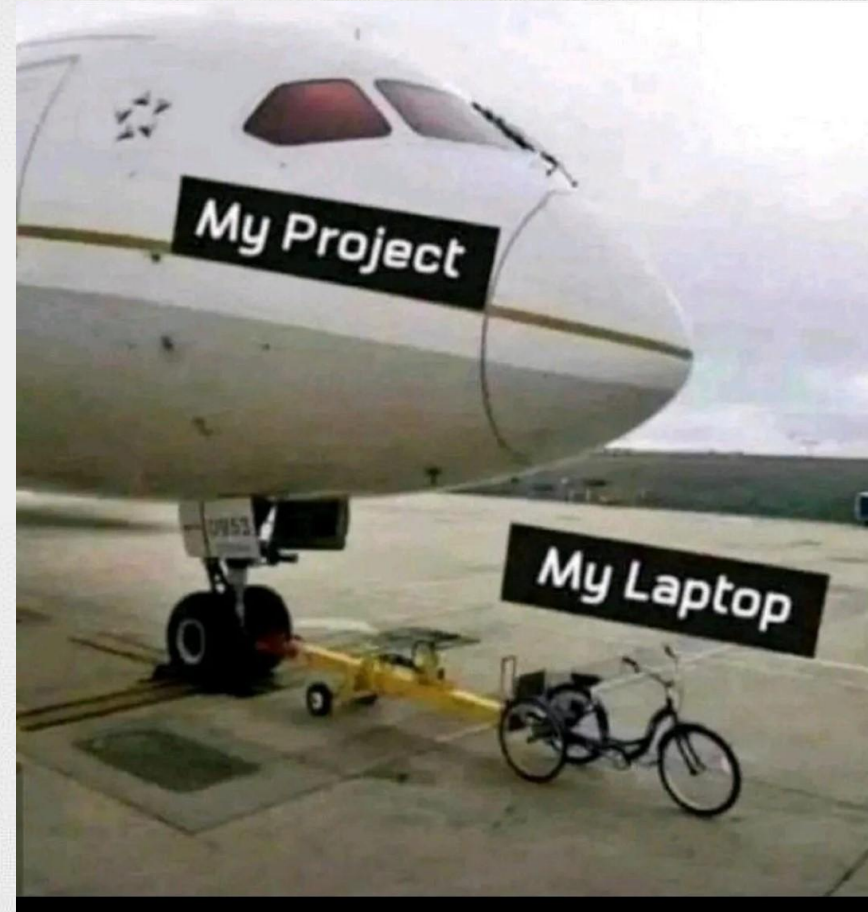
HUGE DATASET



MEMORY ISSUES



COMPUTATIONAL SPACE





PART 03

PRE-PROCESSING



PRE-PROCESSING

APPEND THE LABEL

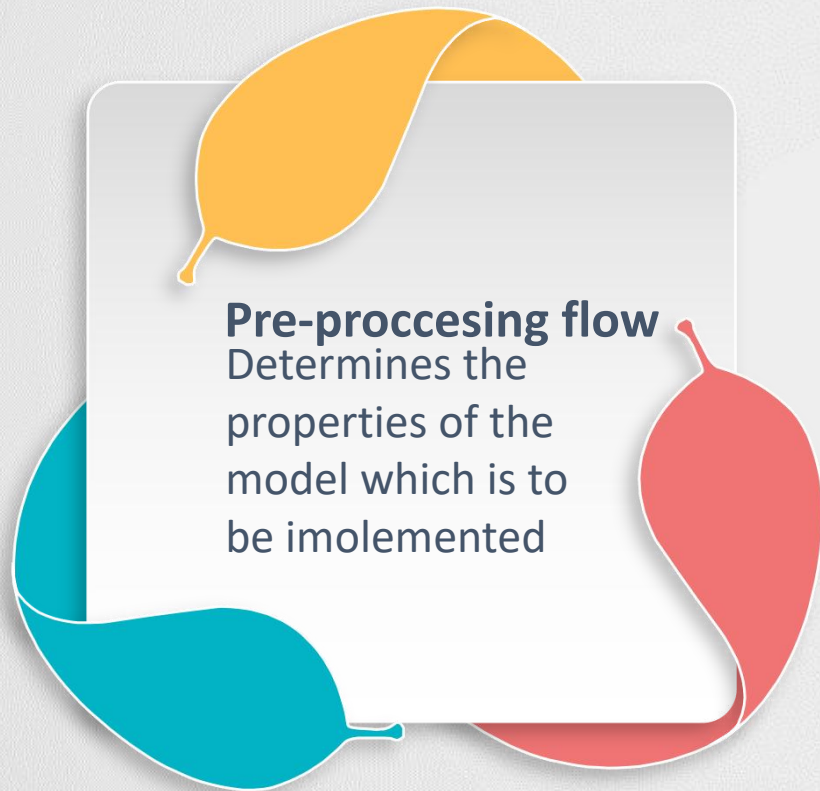
WHEN A DISEASE IS FOUND OR NORMAL
IMAGE IS FOUND APPEND IT TO THE
ARRAY AND LABELS BASED ON THE
CONDITIOON MENTIONED



LOOP FOR DISEASED IMAGES

WE ARE GOING TO SEARCH FOR
THE WHOLE IMAGES AND THEN
APPEND IT BASED ON ITS
CLASSIFICATION

FLOW



READING OF DATA



RESIZE AND APPEND



CONVERSION INTO NUMPY
ARRAY



PART 04

MODEL IMPLEMENTATION

CUSTOM CNN

ADDED 16 filters of size 7×7 and used non-linear activation function called RELU

VGG-16

Converted the 4D output tensor into 2D and connected with 3 new nodes with the pretrained VGG-16 layer with SOFTMAX activation function



TRANSFER LEARNING

Transfer learning is a machine learning technique where a pre-trained model is used as a starting point for a new task or problem.

RESNET-152

Followed the same technique as VGG-16 and used ADAM OPTIMIZER

Hardware elements playing crucial role

The GeForce RTX 2060 features
1,920 CUDA cores, 240 Tensor
Cores that can deliver 52 teraflops
of deep learning horsepower

6gb of vram

16gb ram

intel i9 10th gen



COMPUTE CAPABILITY

Geforce RTX 2070	7.5
------------------	-----

Geforce RTX 2060	7.5
------------------	-----

NVIDIA TITAN V	7.0
----------------	-----

NVIDIA TITAN Xp	6.1
-----------------	-----

NVIDIA TITAN X	6.1
----------------	-----

GeForce GTX 1080 Ti	6.1
---------------------	-----

GeForce GTX 1080	6.1
------------------	-----

GeForce GTX 1070 Ti	6.1
---------------------	-----

GeForce GTX 1070	6.1
------------------	-----

GeForce GTX 1060	6.1
------------------	-----

GeForce GTX 1050	6.1
------------------	-----

Geforce RTX 2060	7.5
------------------	-----

GeForce GTX 1080	6.1
------------------	-----

GeForce GTX 1070	6.1
------------------	-----

GeForce GTX 1060	6.1
------------------	-----

GeForce GTX 980	5.2
-----------------	-----

GeForce GTX 980M	5.2
------------------	-----

GeForce GTX 970M	5.2
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GeForce GTX 965M	5.2
------------------	-----

GeForce GTX 960M	5.0
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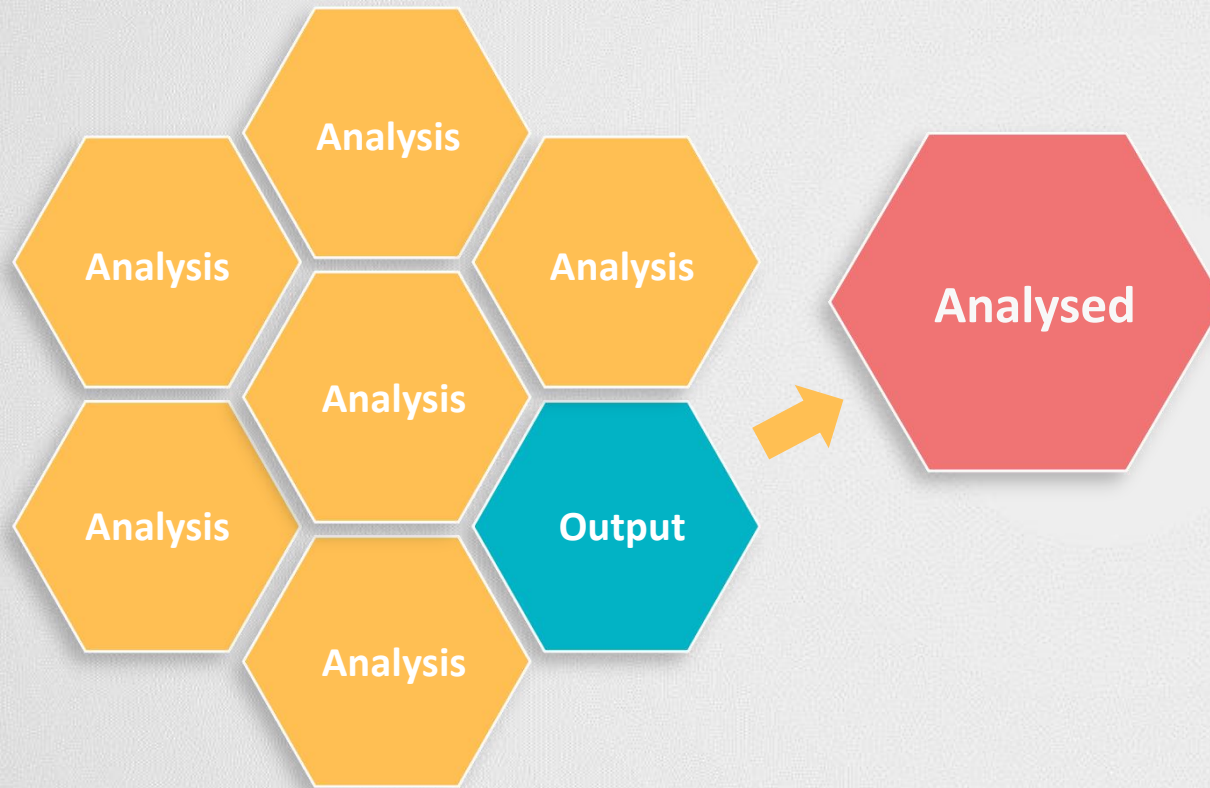
GeForce GTX 950M	5.0
------------------	-----

GeForce 940M	5.0
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The Results.

S.NO	Model Used	ACCURACY			Precision			Recall		
		Train	Test	Val	Train	Test	Val	Train	Test	Val
1	Custom CNN	0.7601	0.5817	0.875	0-0.94	0-0.99	0-1.0	0-0.99	0-0.47	0-0.88
					1-0.96	1-0.80	1-0.00	1-0.10	1-0.15	1-0.00
					2-0.68	2-0.48	2-0.88	2-0.81	2-0.65	2-0.88
2	VGG-16	0.8932	0.6474	0.875	0-1.00	0-0.99	0-1.00	0-1.00	0-0.38	0-0.88
					1-0.97	1-0.52	1-0.00	1-0.61	1-0.51	1-0.00
					2-0.83	2-0.62	2-0.88	2-0.99	2-0.99	2-0.88
3	RESNET 152	0.7875	0.6762	0.875	0-1.83	0-0.88	0-0.80	0-0.99	0-0.51	0-1.00
					1-0.80	1-0.64	1-0.00	1-0.36	1-0.44	1-0.00
					2-0.76	2-0.61	2-1.00	2-0.91	2-0.98	2-0.86

The Output.

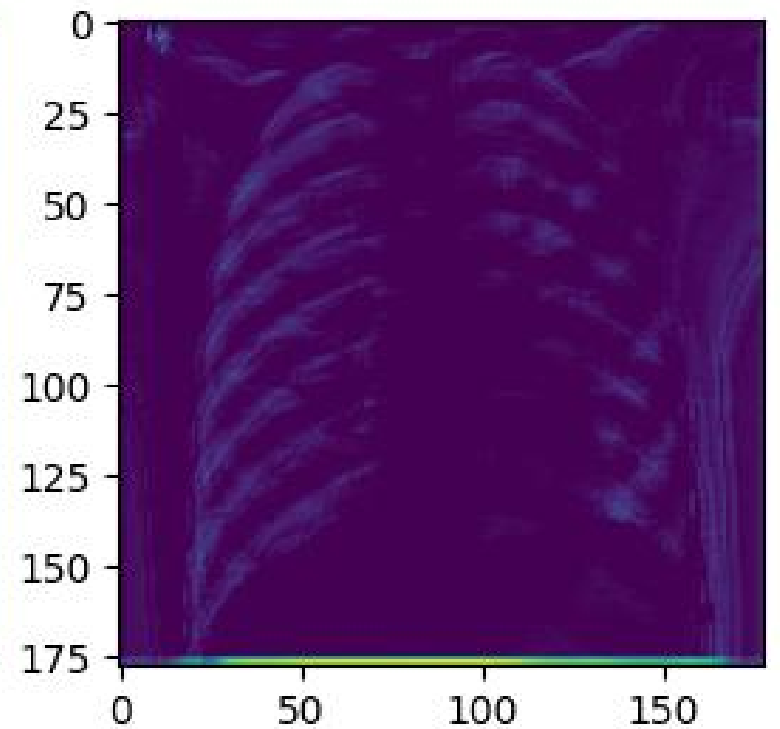
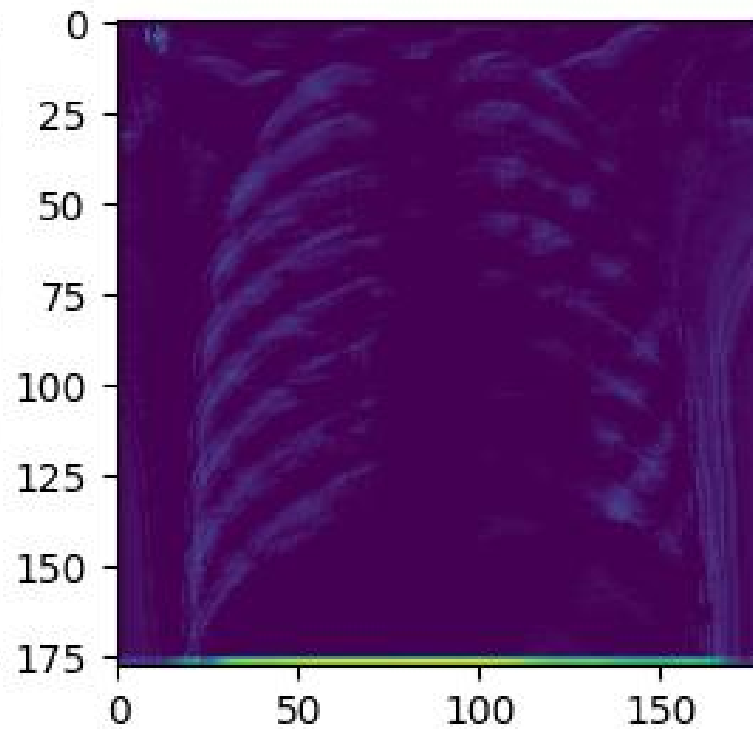
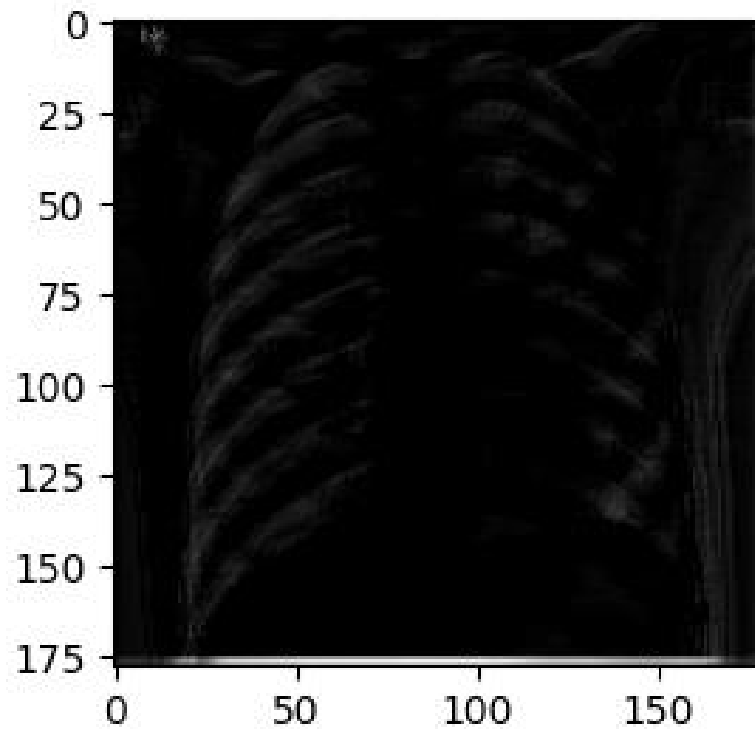


3 Classes diseases percentage

We are able to successfully portray the result of the disease present in the x-ray and the different classes of it along with the kernel output on the layer of which the model is able to see.

THE OUTPUT

Viral Pneumonia : 0.04 Bacterial Pneumonia : 0.96 Normal : 0.00



THANK YOU

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