
1.00
Share
MRI Sequence, Axial View
0:32 / 3:26
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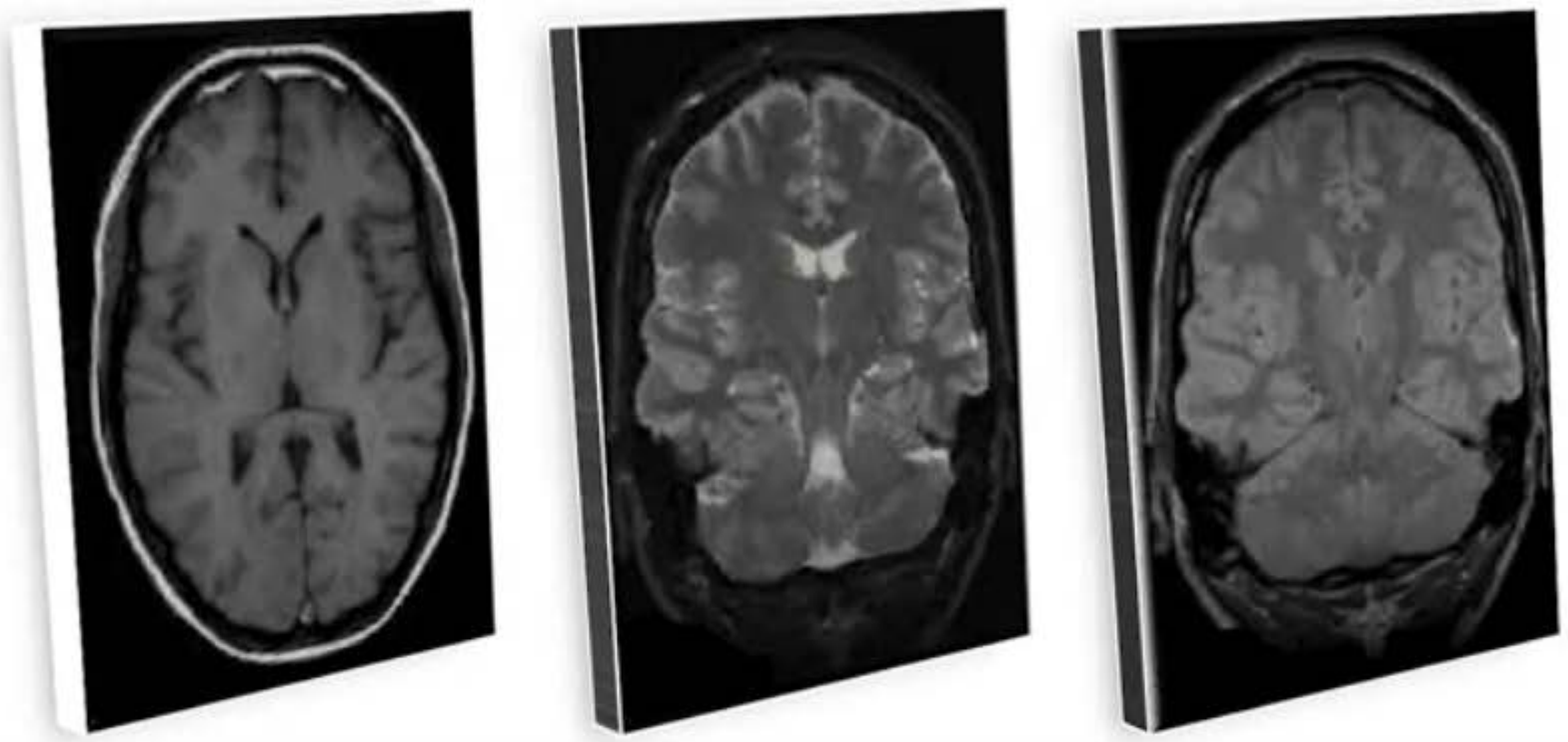
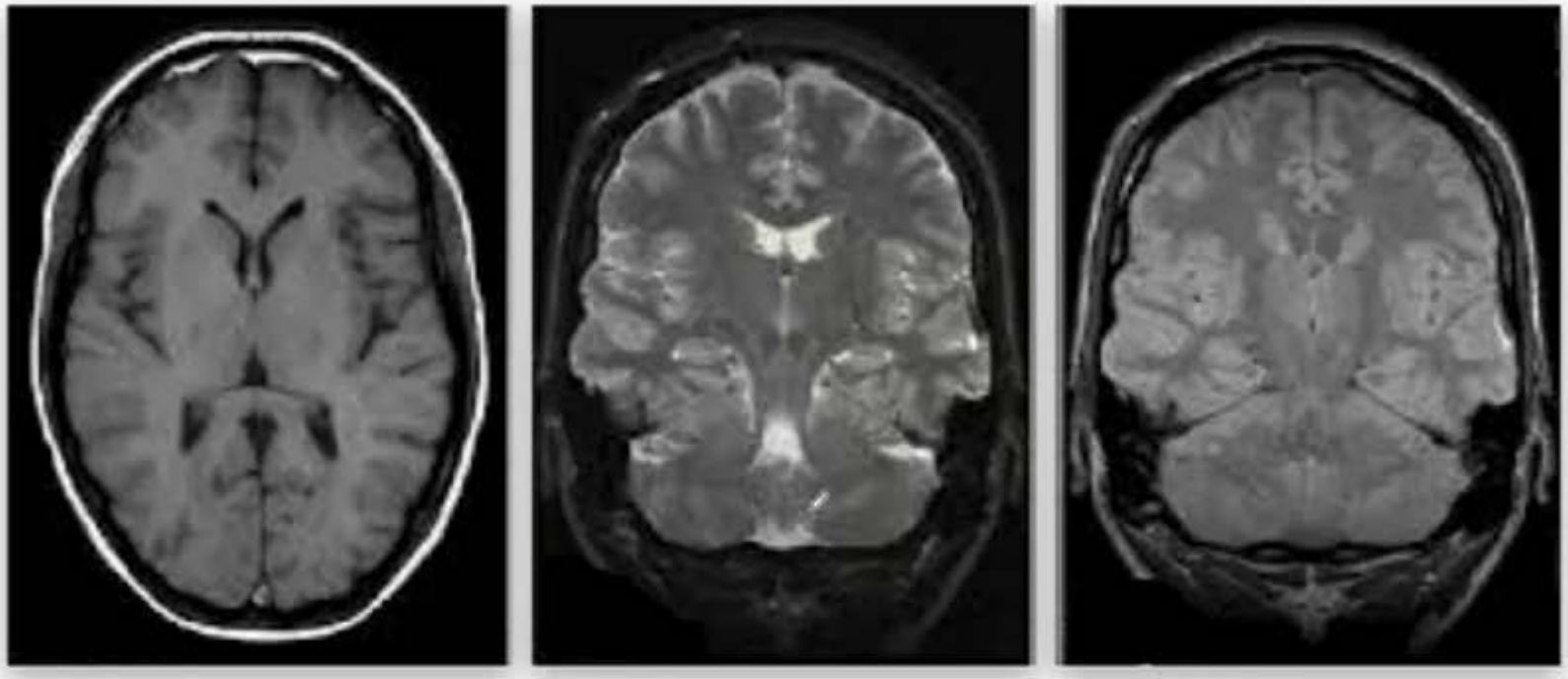
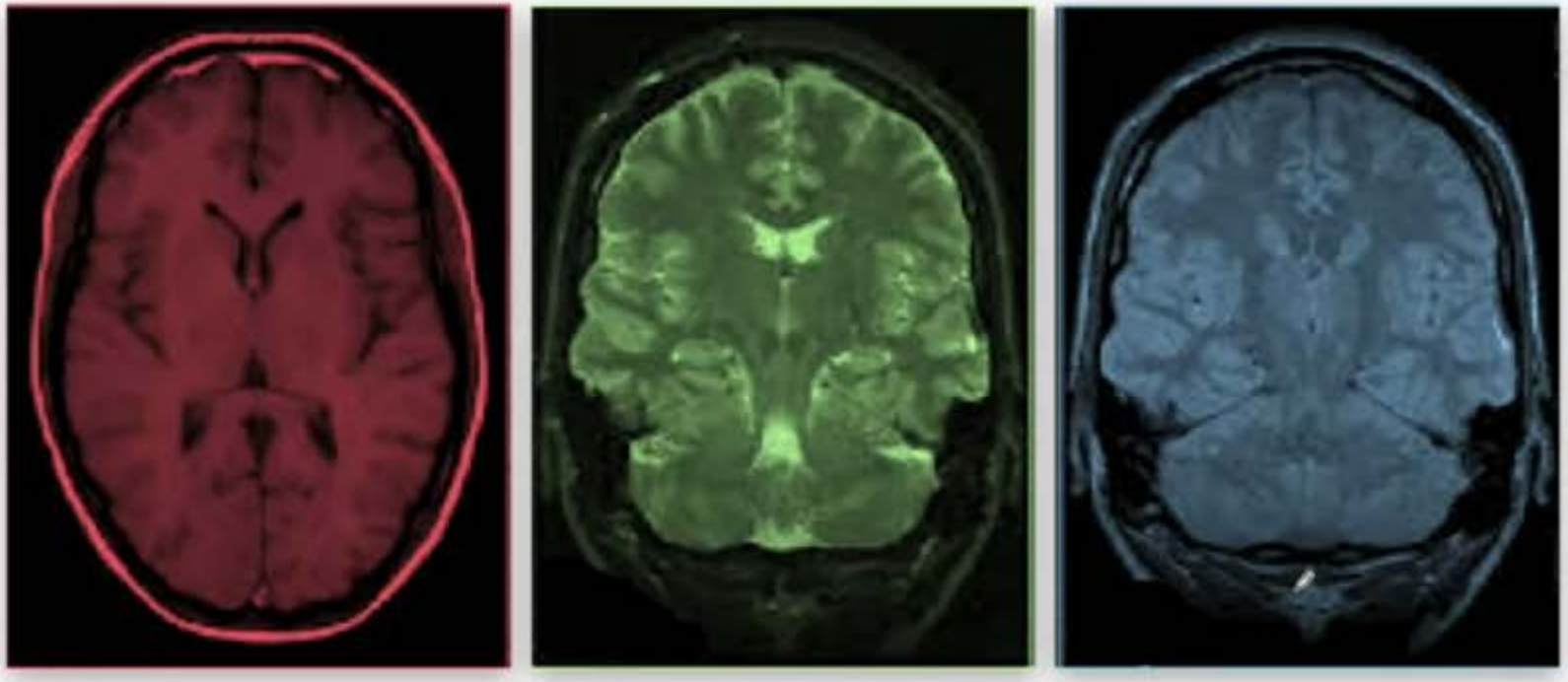


MRI Example consists of multiple imaging sequences

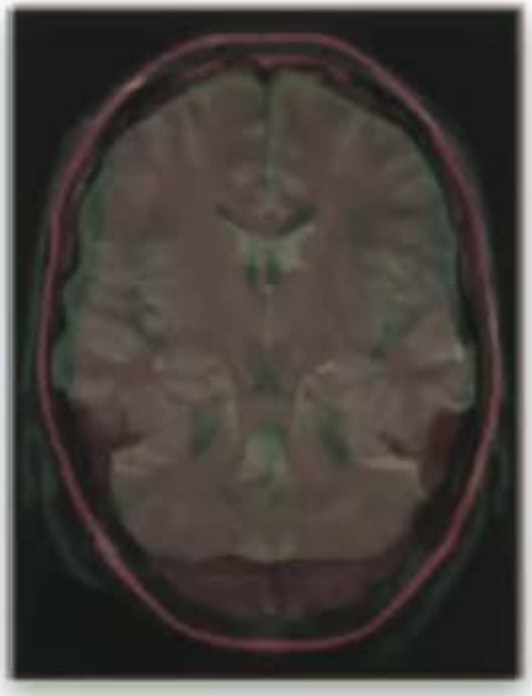
1.00



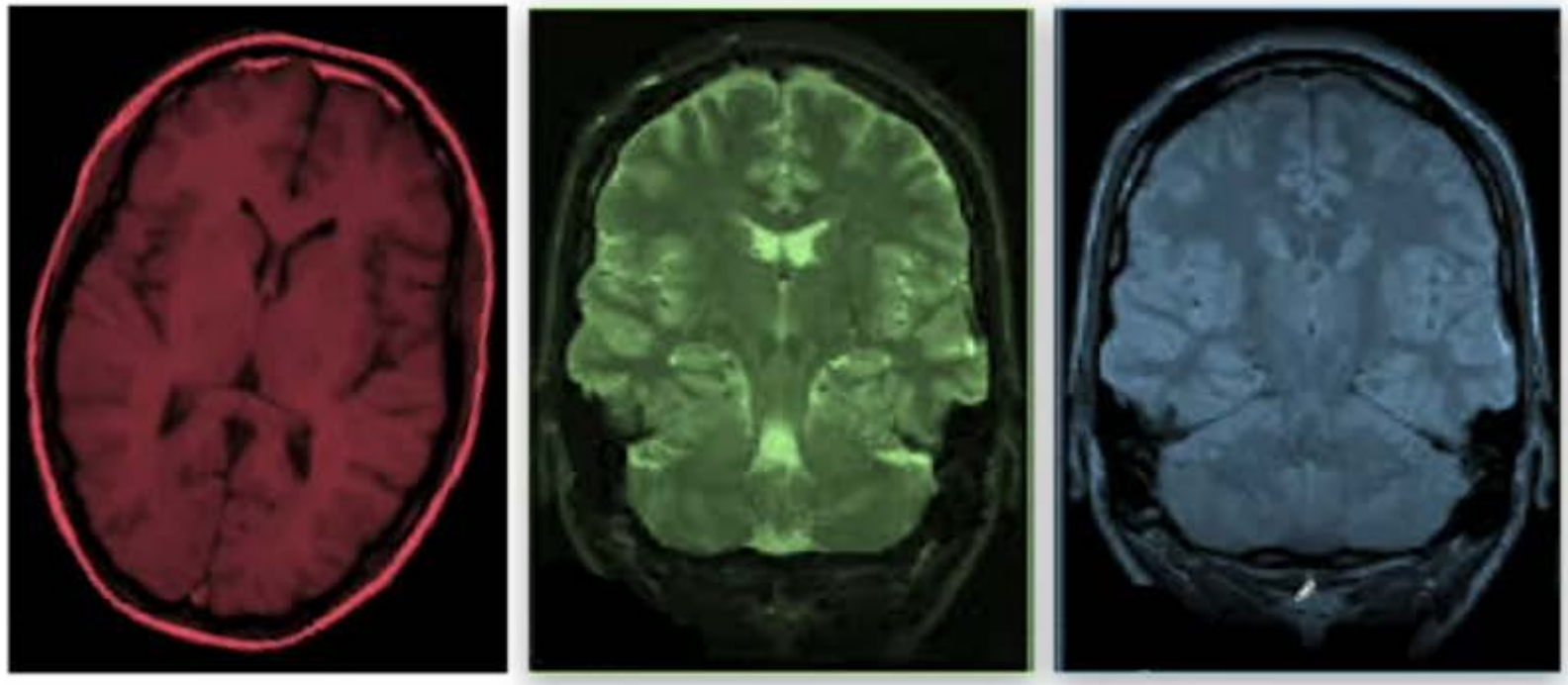
Pick a slice



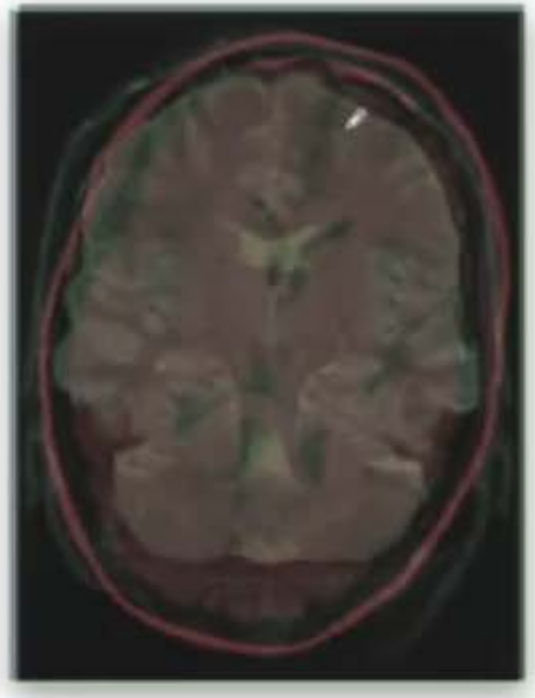
Different Channels



Combine Channels



Misaligned



Combine Channels


1.00
Share
Misaligned
Aligned
2:54 / 3:26
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1.00
Share
Image Registration
2:57 / 3:26
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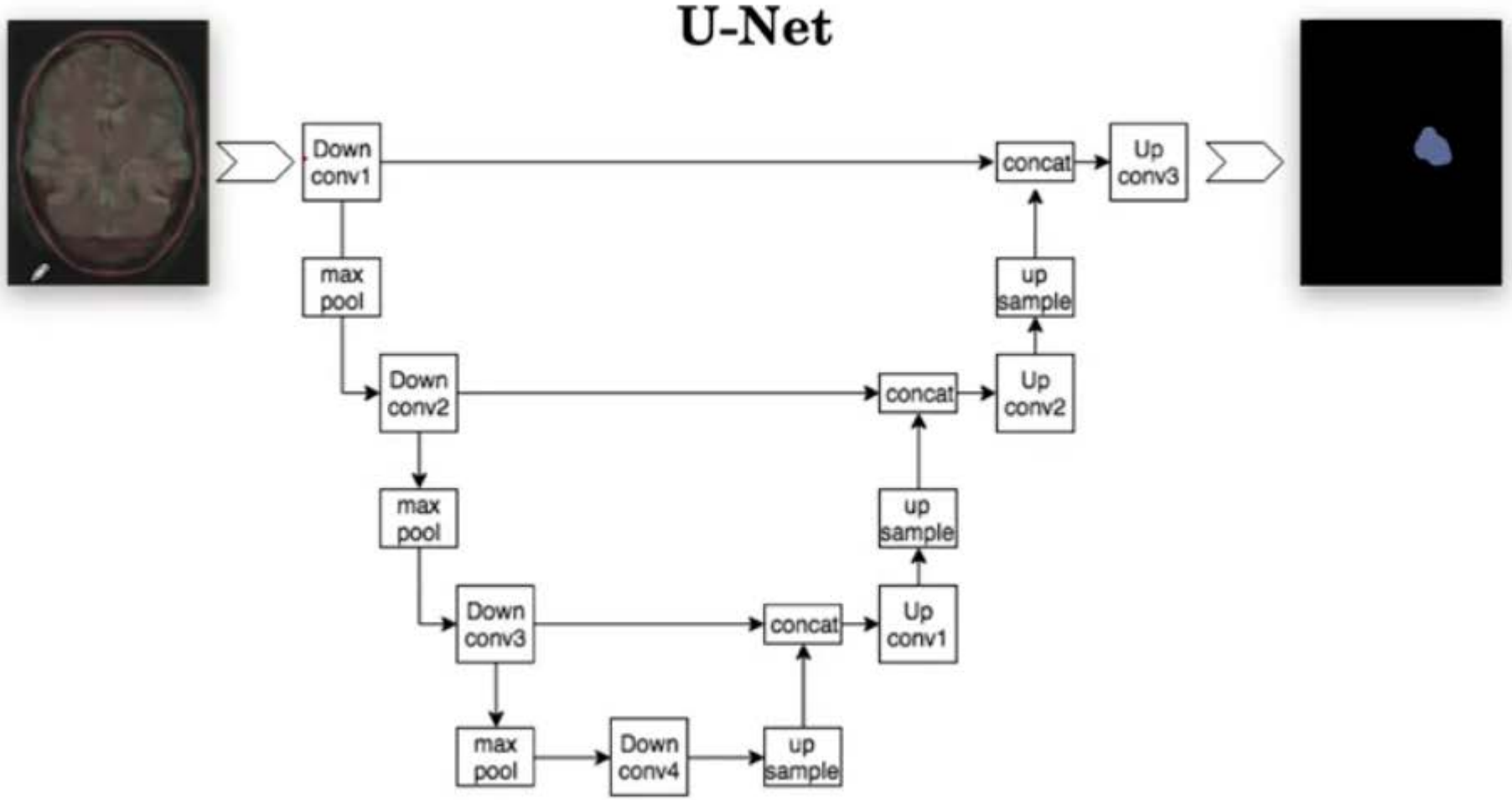
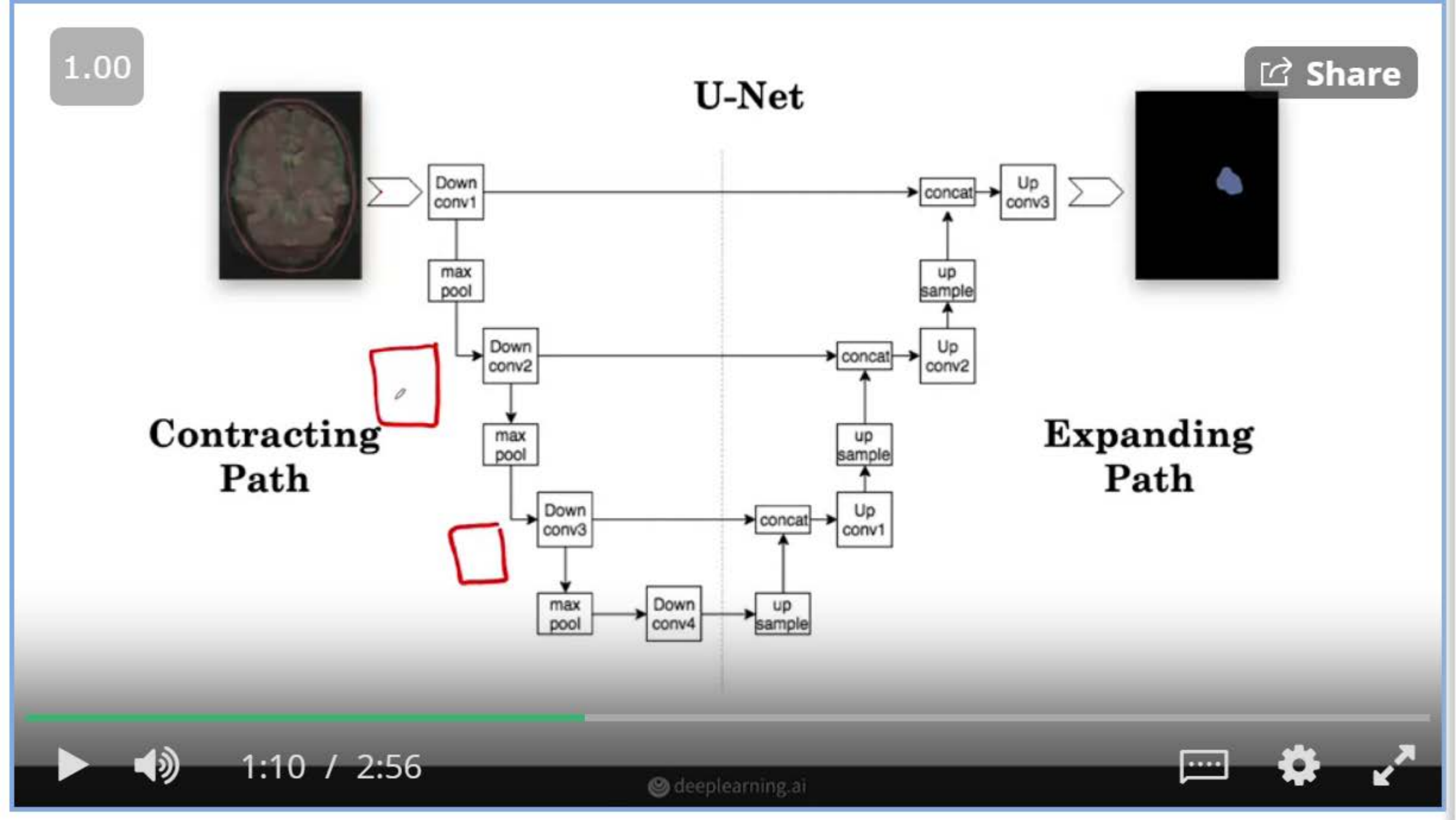


Segmentation Architecture


1.00
Share
U-Net
Down conv1
max pool
Down conv2
max pool
Down conv3
max pool
Down conv4
up sample
up sample
up sample
up sample
concat
concat
concat
Up conv3
Up conv2
Up conv1
Contracting Path
Expanding Path
1:10 / 2:56
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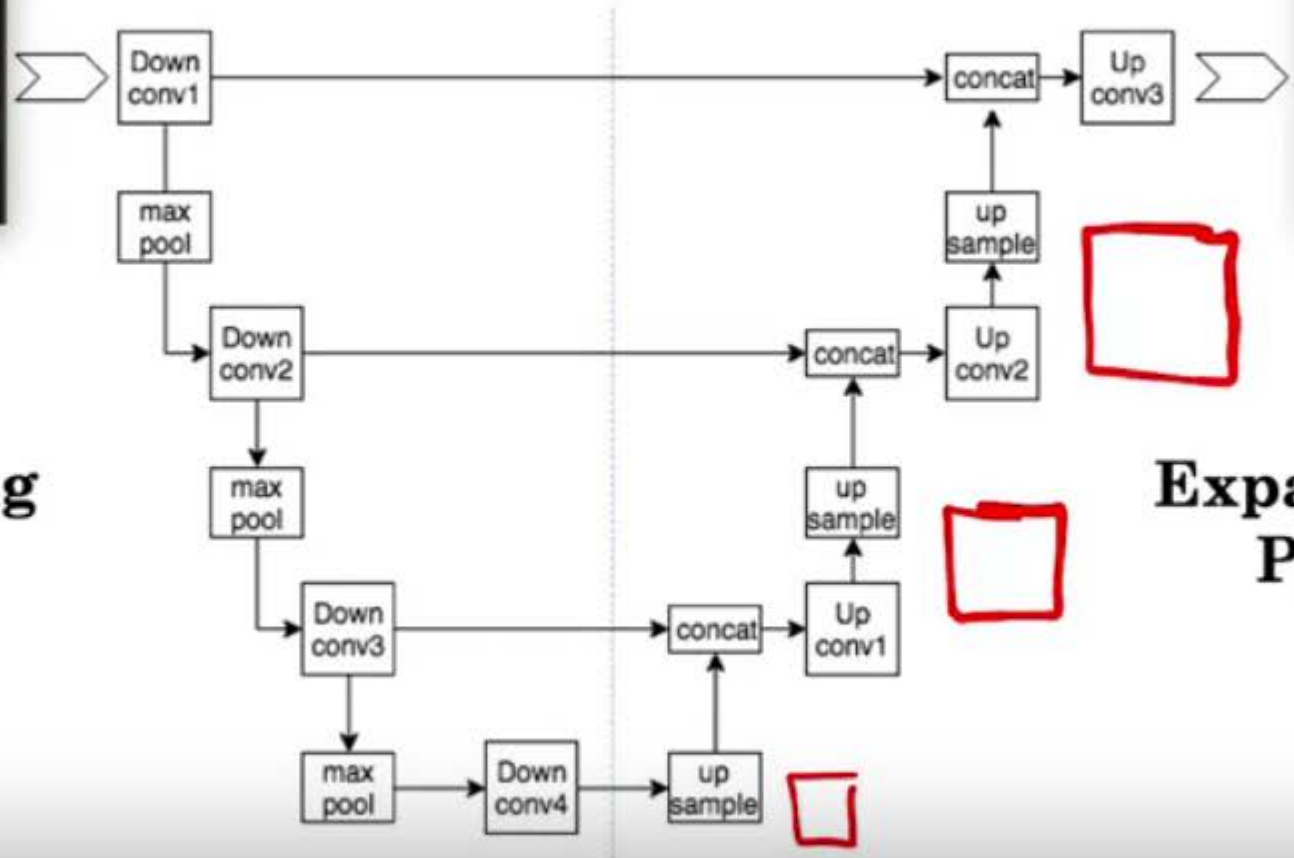
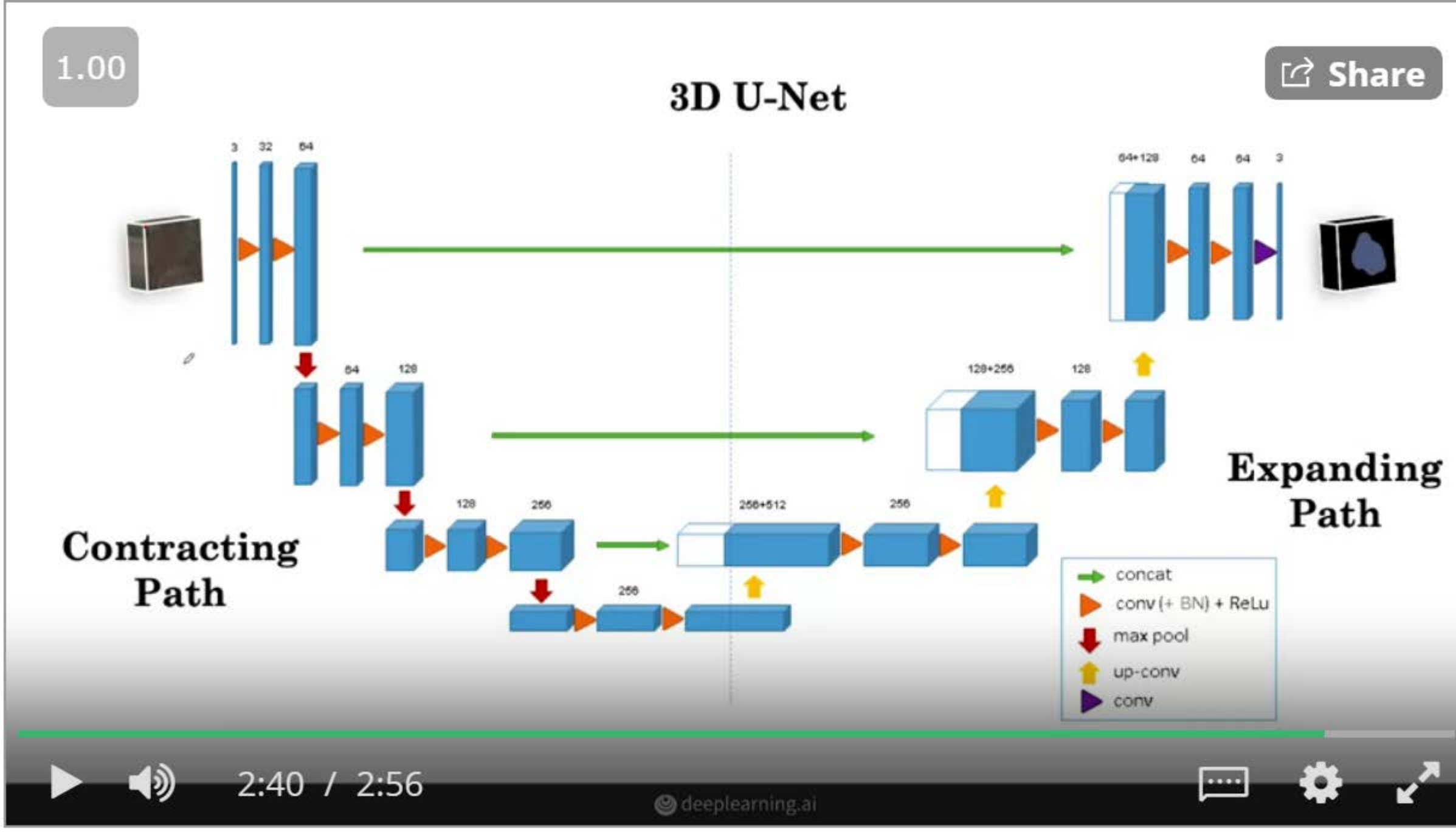
U-Net



Contracting Path

Expanding Path


1.00
Share
3D U-Net
3
32
64
64
128
128
256
256
256
128+256
128
64+128
64
64
3
256+512
256
Contracting Path
Expanding Path
concat
conv (+ BN) + ReLu
max pool
up-conv
conv
2:40 / 2:56
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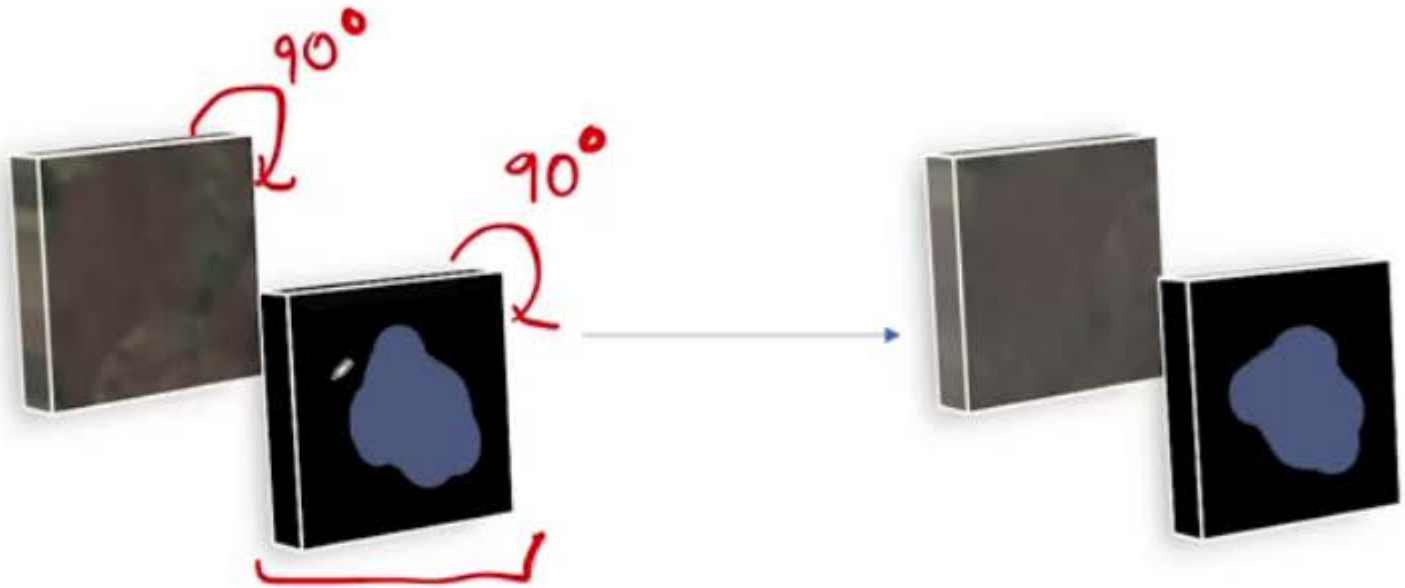
Mass

Mass

Mass

Mass

Data Augmentation



Data Augmentation

1.00
Share
Prediction
Ground Truth
Loss
1:17 / 2:02
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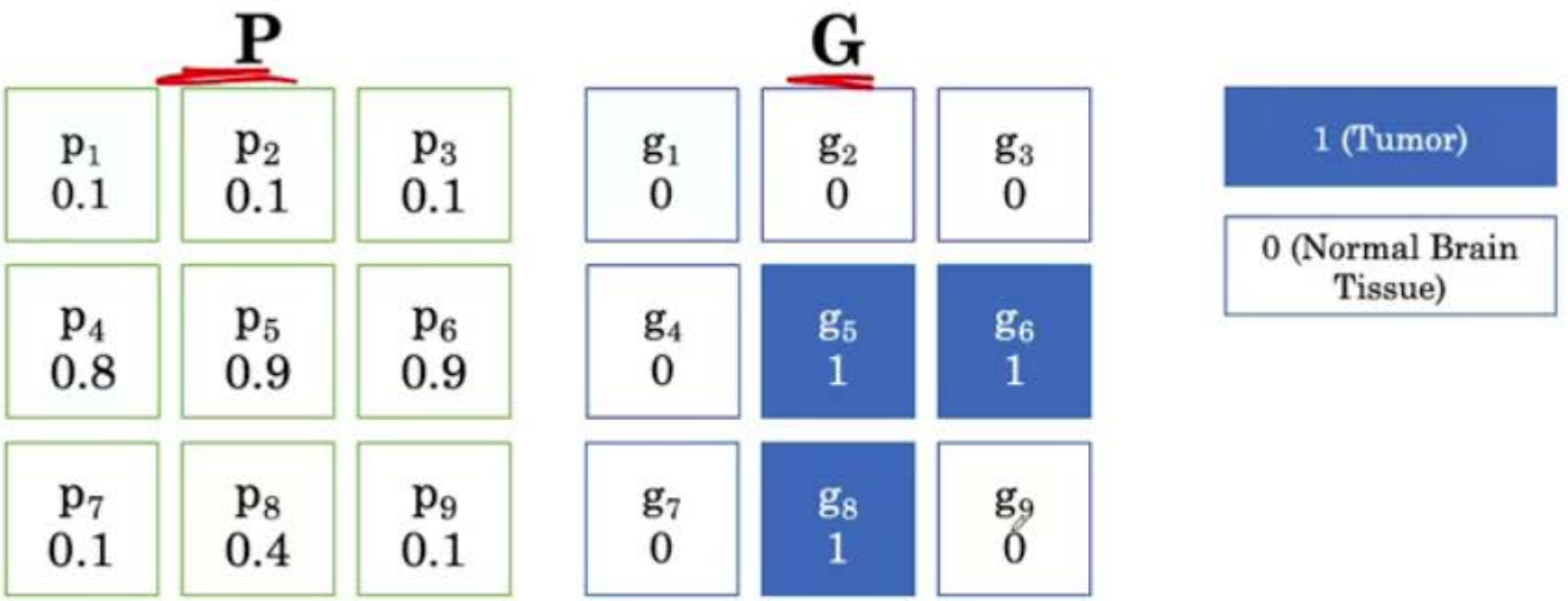
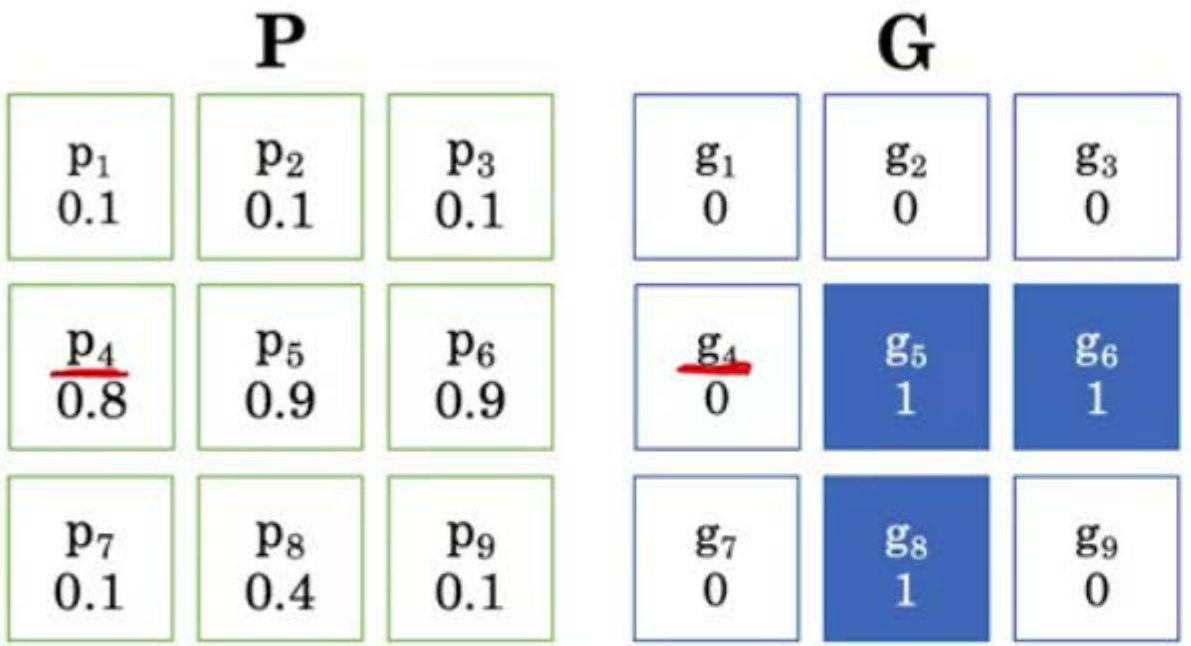
1.00


P
G
p1 0.1
p2 0.1
p3 0.1
p4 0.8
p5 0.9
p6 0.9
p7 0.1
p8 0.4
p9 0.1
g1 0
g2 0
g3 0
g4 0
g5 1
g6 1
g7 0
g8 1
g9 0
1 (Tumor)
0 (Normal Brain Tissue)



i	p	g
1	0.1	0
2	0.1	0
3	0.1	0
4	0.8	0
5	0.9	1
6	0.9	1
7	0.1	0
8	0.4	1
9	0.1	0

i	p	g	$p_i g_i$	p_i^2	g_i^2
1	0.1	0	0	0.01	0
2	0.1	0	0	0.01	0
3	0.1	0	0	0.01	0
4	0.8	0	0	0.64	0
5	0.9	1	0.9	0.81	1
6	0.9	1	0.9	0.81	1
7	0.1	0	0	0.01	0
8	0.4	1	0.4	0.16	1
9	0.1	0	0	0.01	0
			2.2	**2.47**	**3**

Soft Dice Loss

$$L(P, G) = 1 - \frac{2\sum_i^n p_i g_i}{\sum_i^n p_i^2 + \sum_i^n g_i^2}$$

$$= 1 - \frac{2 \times 2.2}{2.47 + 3}$$

$$= 1 - \frac{4.4}{5.47}$$

$$\approx 0.2$$

1.00

US

the hospitals where we've
trained our model in the US.


1.00
Share
generalize to the resolution
1:46 / 1:49
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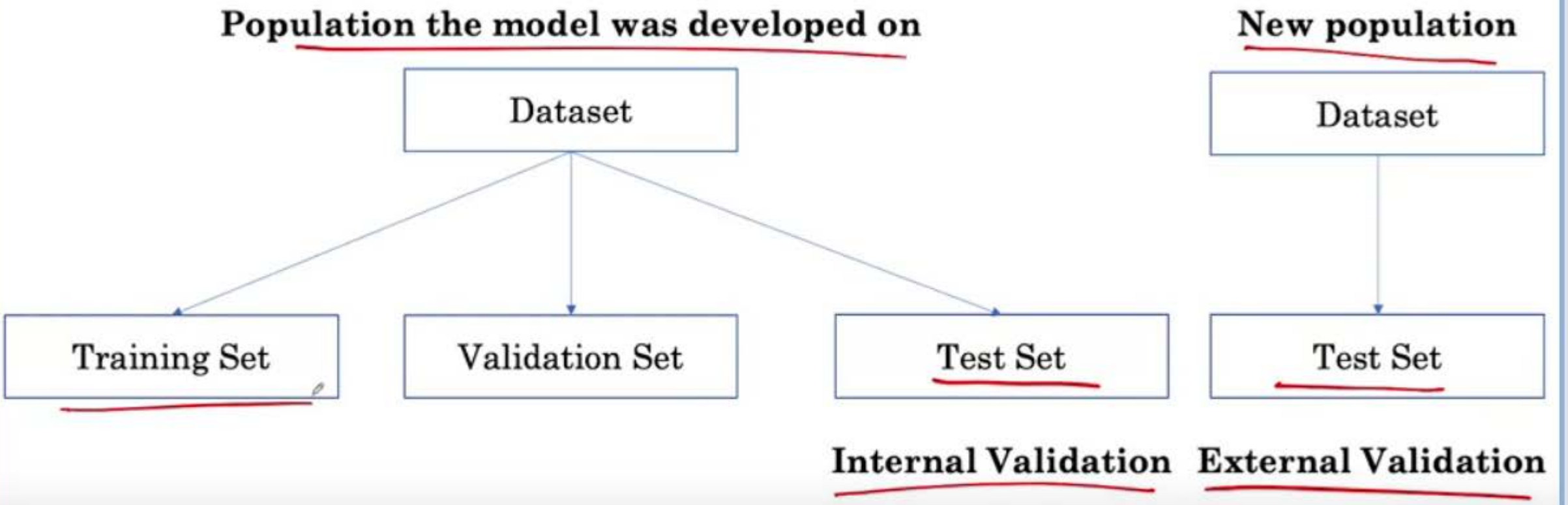
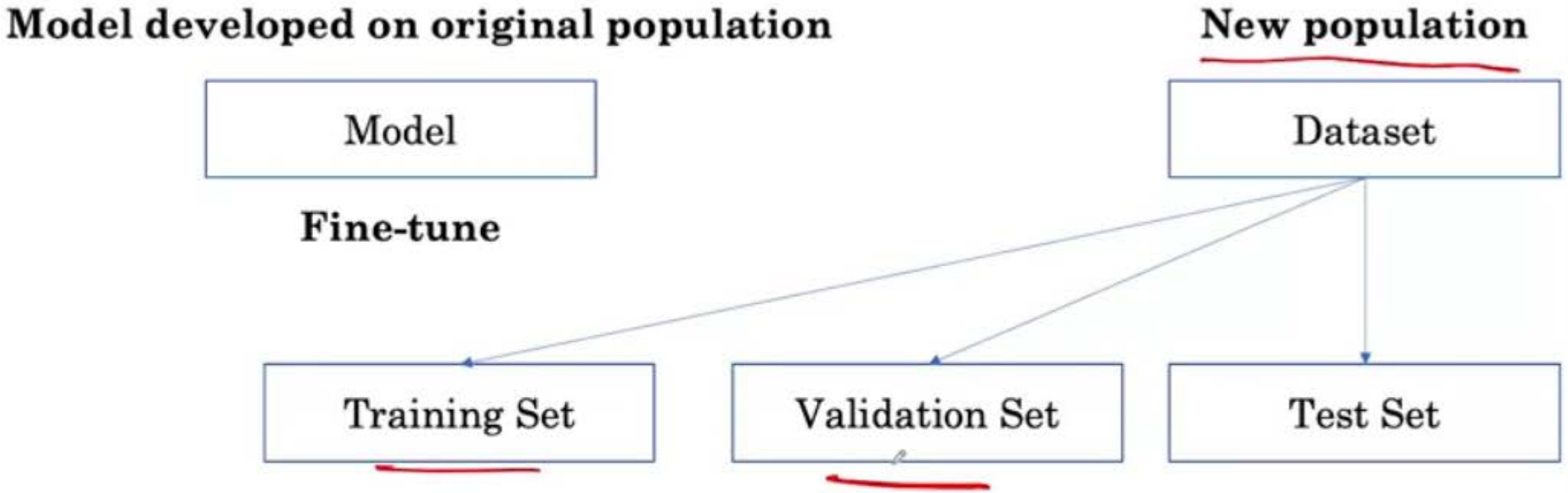


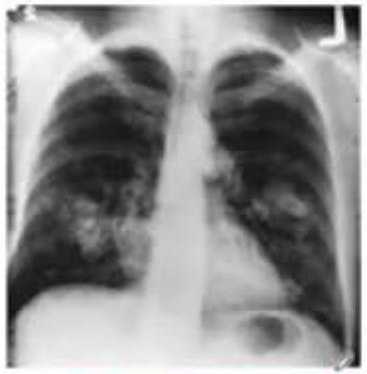
set is drawn from the same distribution as the training set for the model.



training and validation set and
then fine-tune the model on this new data.

Retrospective (Historical) Data

Dataset

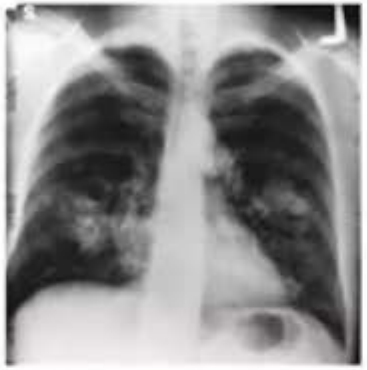


Real-World / Prospective Data

Dataset

Retrospective (Historical) Data

Frontal



Raw Dataset

Cleaned Dataset

Training Set

Validation Set

Test Set

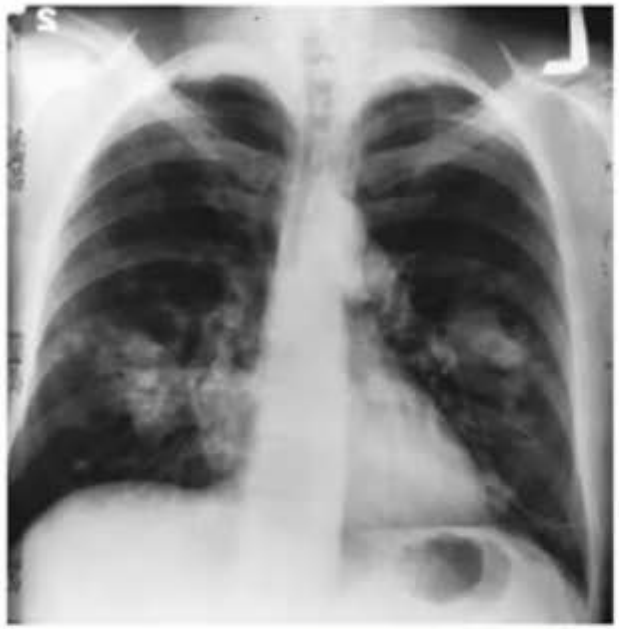
Lateral

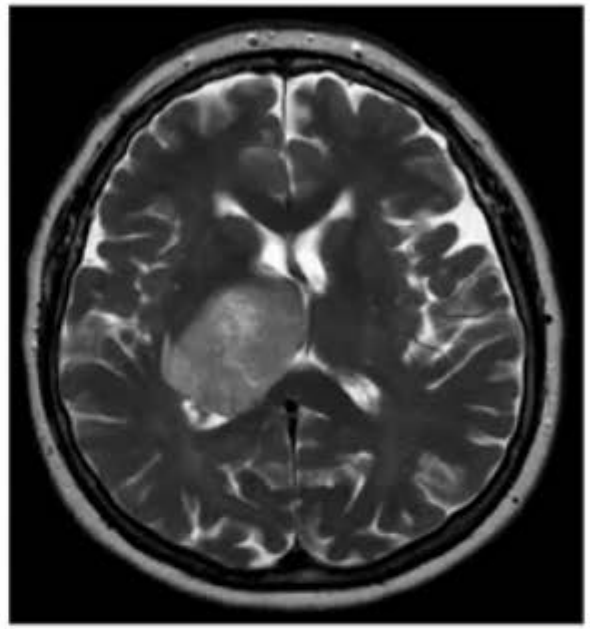
Real-World / Prospective Data

Raw Dataset

1.00

Share





AUROC

Dice Score

Decision Curve Analysis

Randomized Controlled Trials

0:49 / 3:14

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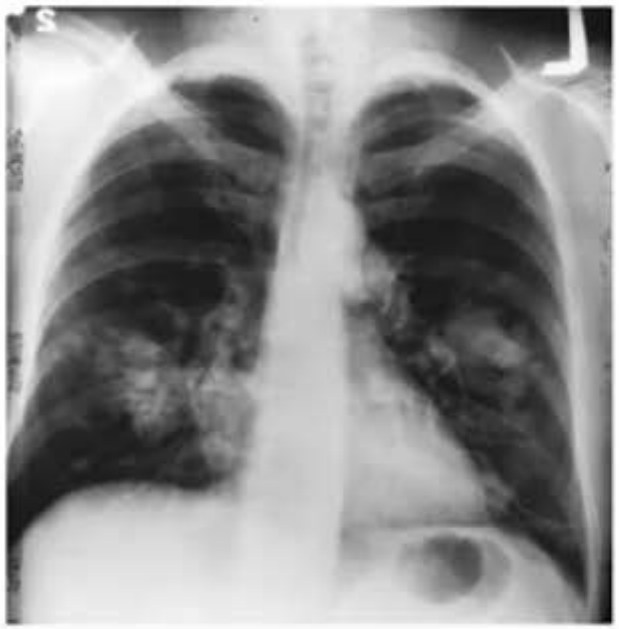
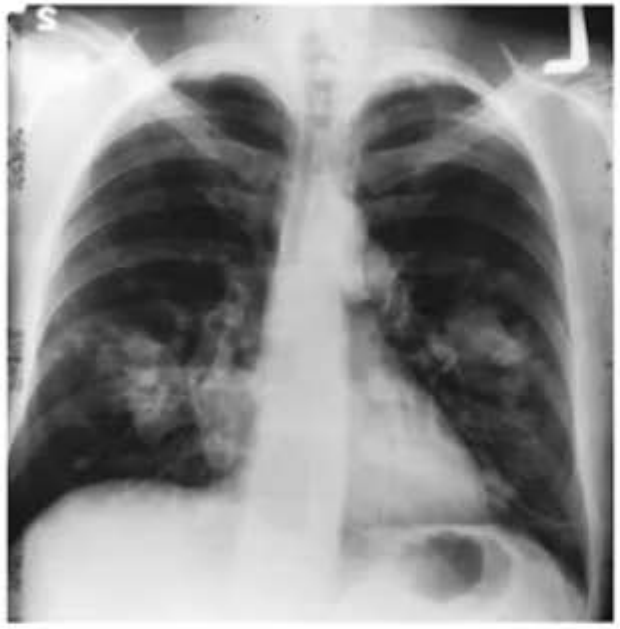


Effect of the model across

- Age
- Sex
- Socioeconomic Status

1.00

Share



Model Interpretation

Play

2:35 / 3:14

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