

Holistic network for quantifying uncertainties in medical images*

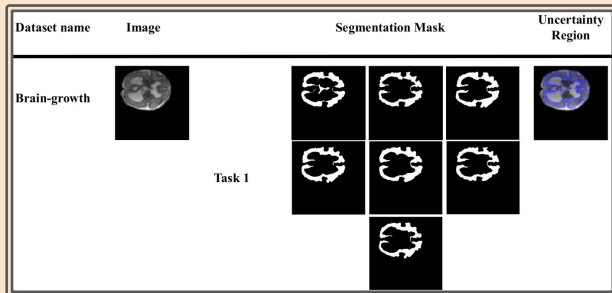
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Background and Overview



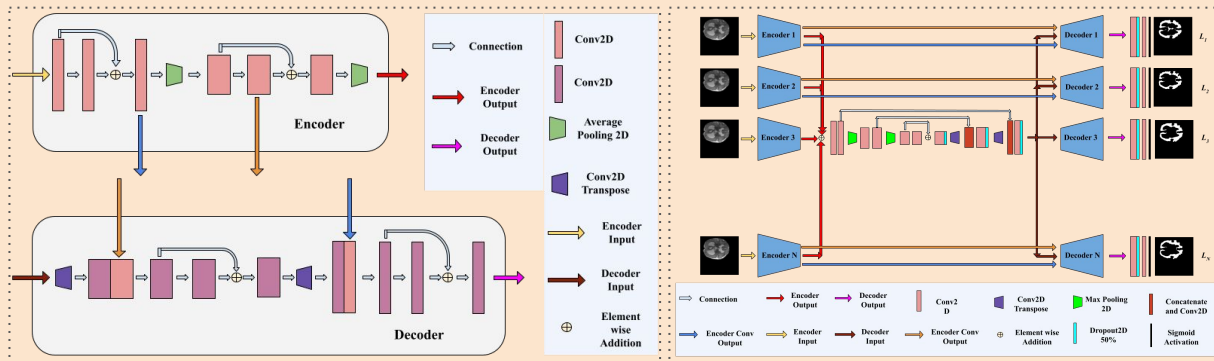
Dataset from QUBIQ-2020 Challenge

Dataset	#Training	#Validation	#Test	#Task	#Input Dimension
Brain-Growth	34	5	10	1	256x256x1
Brain-Tumor	28	4	8	3	240x240x4
Kidney	20	4	4	1	497x497x1
Prostate	48	7	13	2	640x640x1 and 960x640x1

Loss Function: Tversky loss

$$L_{Tversky} = \frac{TP + s}{TP + \alpha FN + \beta FP + s}$$

Proposed Model: Use N-Encoders and Decoders to model different Radiologists



Summary

- A common block to capture the patterns of the whole dataset.
- Multiple Encoder Decoder to model individual radiologists.
- Focal Tversky loss function to get accurate masks.
- Nadam Optimizer with a learning rate of 1e-05 was used.
- Model were trained for 100 epochs using Tesla T4 GPUs.

Results on validation QUBIQ-2021 dataset

Dataset	Task1	Task2	Task3
Brain-Growth	89.76	-	-
Brain-Tumor	92.15	36.68	65.69
Prostate	60.53	38.46	-
Kidney	95.20	-	-