

# Evaluating current state of suspect anomalies in medical scans through Deep Learning

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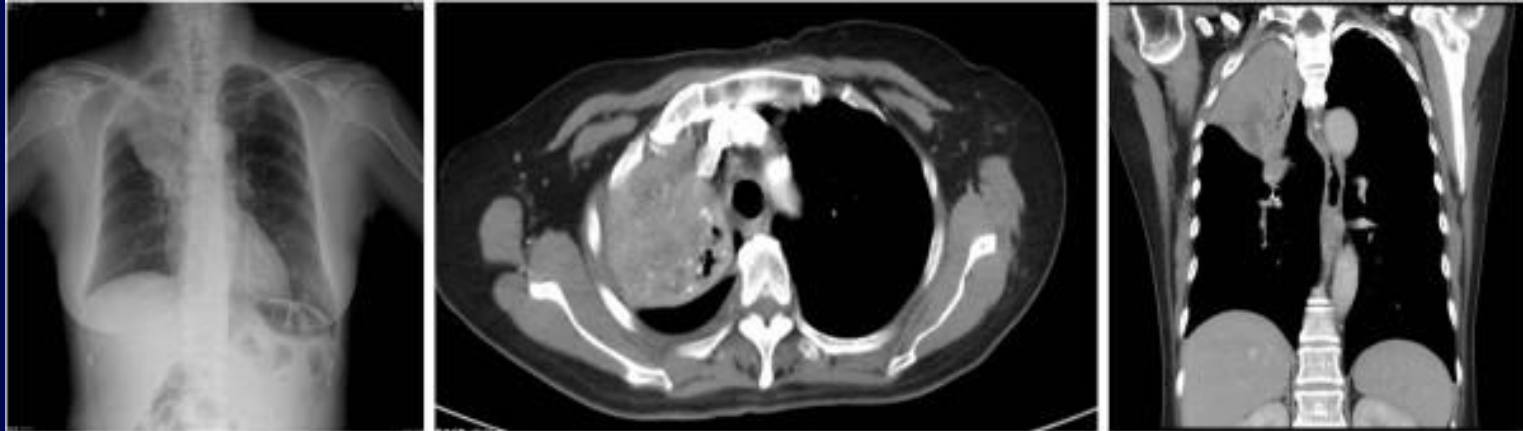


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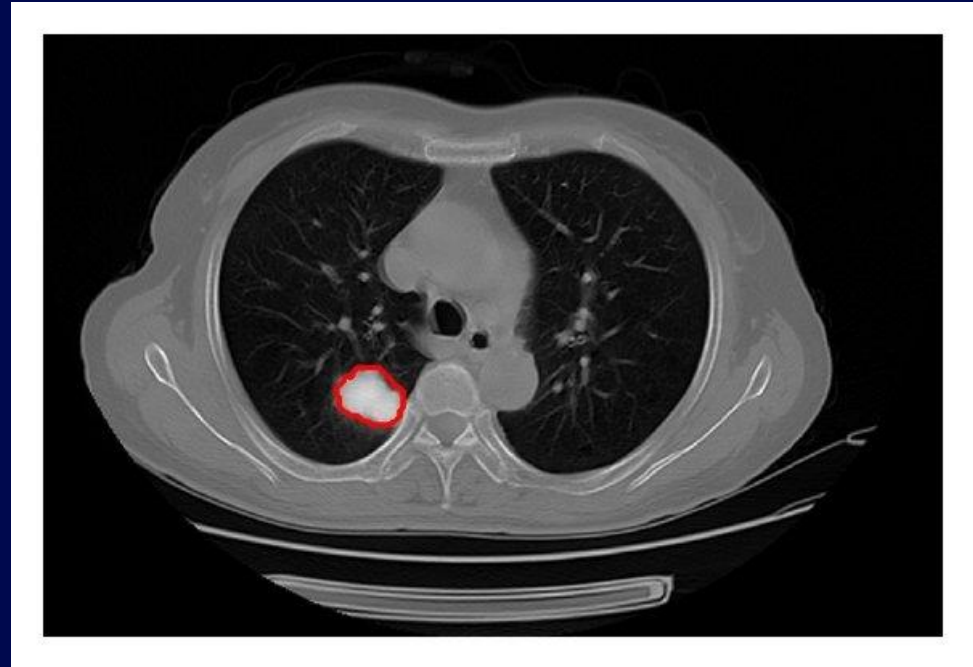
## Space occupying lesions in Medical scans

Space-occupying lesions are pathological structures that have a recognizable volume and that can affect nearby structures



## Space occupying lesions in Medical scans

- Every lesion must be delineated by human intervention . This process is subjective
- In order to track the trajectory of the lesion, this process must be repeated after therapy







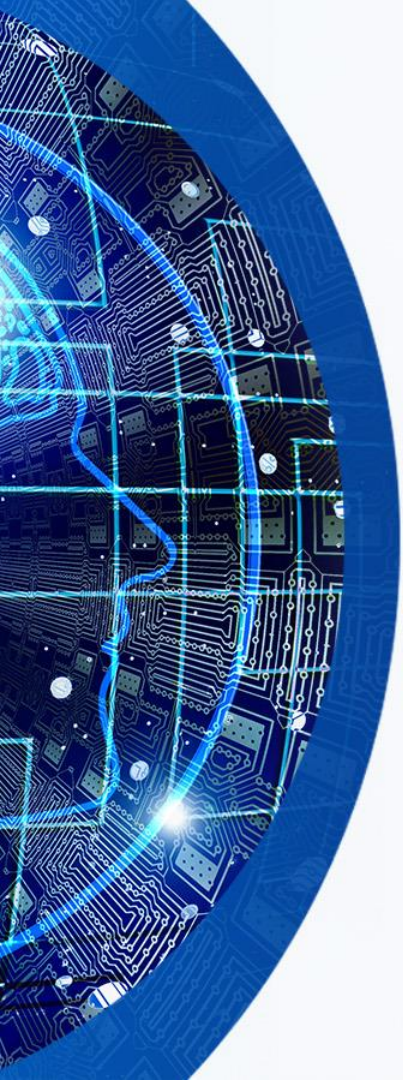
## Therapy for suspect lesions

There are many therapies in case of suspect lesions such as :

- Chemotherapy
- Radiation therapy etc.

The doctor evaluates the trajectory of the lesion after each therapy





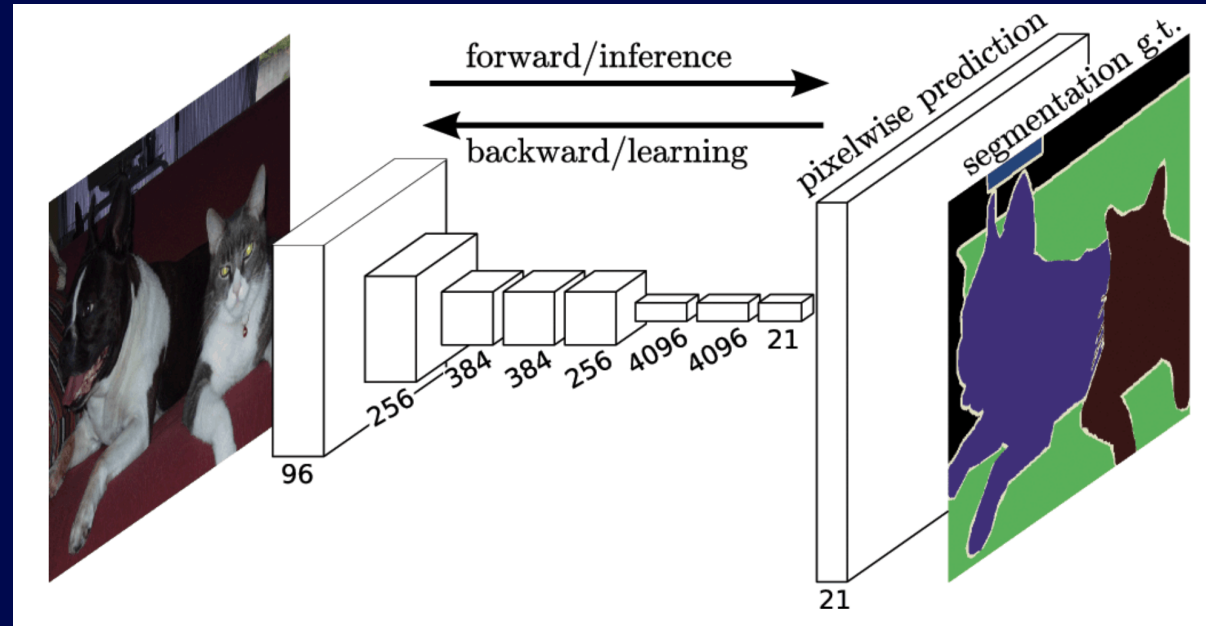
Clinical question : Can an algorithm track the development of a lesion before and after a therapy?

These are the reasons leading doctors to search for such an algorithm:

- The need of automatization
- The need of lesion' s precise segmentation.
- The need of convenience in safe tracking of every patient' s trajectory.
- The need of saving precious time

# Segmentation in Machine Learning

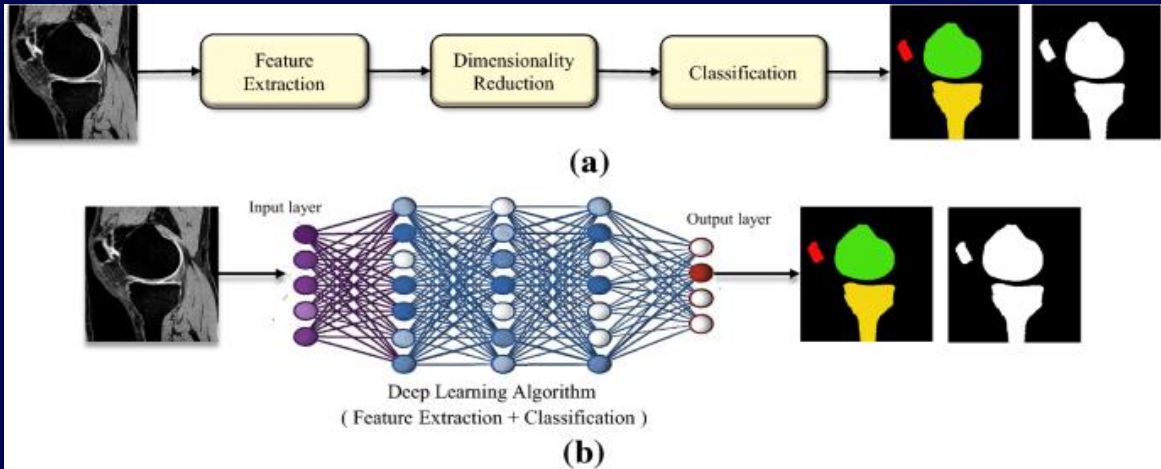
- Image segmentation is the task of clustering parts of an image together that belong to the same object class.
- It involves partitioning images (or video frames) into multiple segments or objects.



# Segmentation in Machine Learning

There are 2 approaches to segment objects:

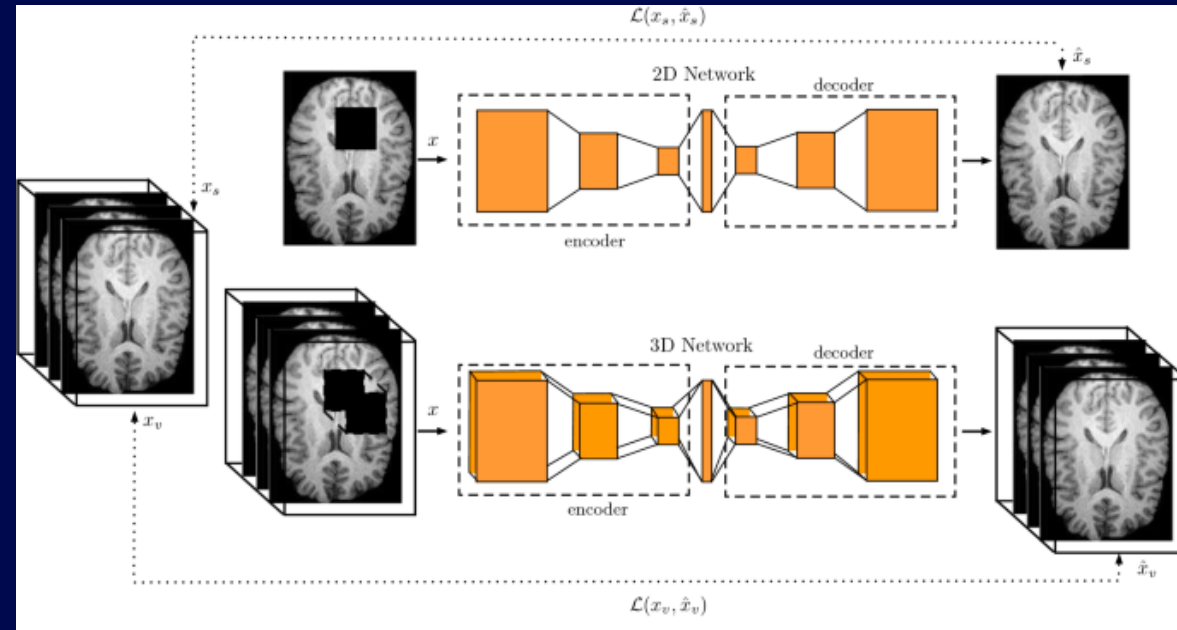
- Machine learning where there is need for human intervention
- Deep Learning ,where everything is automated and there is no need for human intervention.





# 3D Segmentation

- 3D segmentation is the segmentation task which is achieved in a volume by segmenting a Region Of Interest (ROI).
- In other words, a stack of 2D images are segmented individually and when are putted together they form the segmented 3D ROI.







## The rationale for addressing the problem

- We will use 3D segmentation to isolate the ROI which the doctor indicates.
- We will segment this ROI before and after the therapy.
- The changes in ROI will be recorded and the doctors can easily have an intuition about how well the patient responded to therapy.

