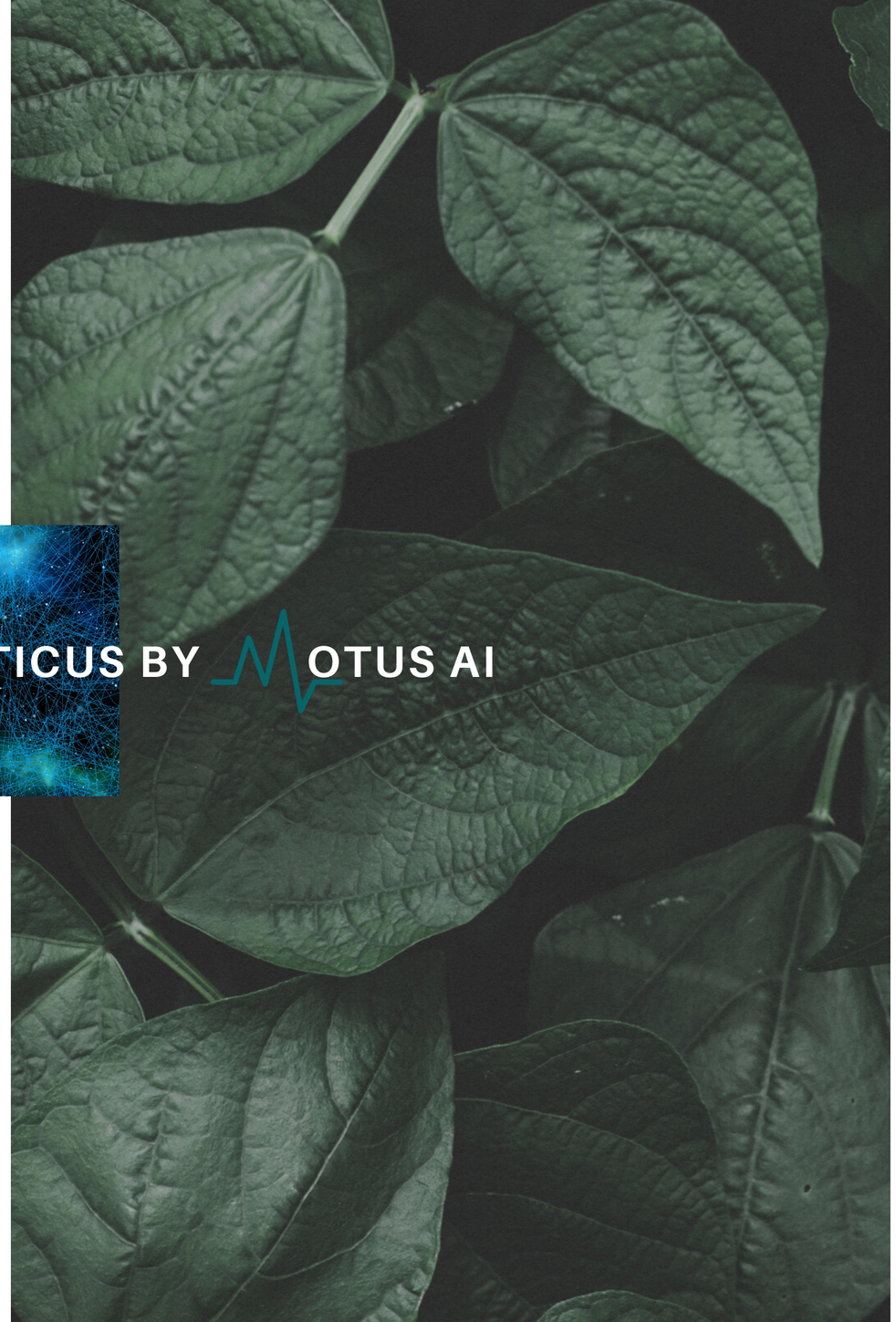


ATTICUS BY OTUS AI

Smarter Hospitals

Improved Outcomes

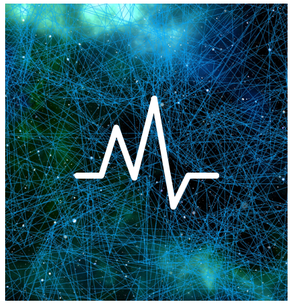
5% of Americans are Misdiagnosed Every Year

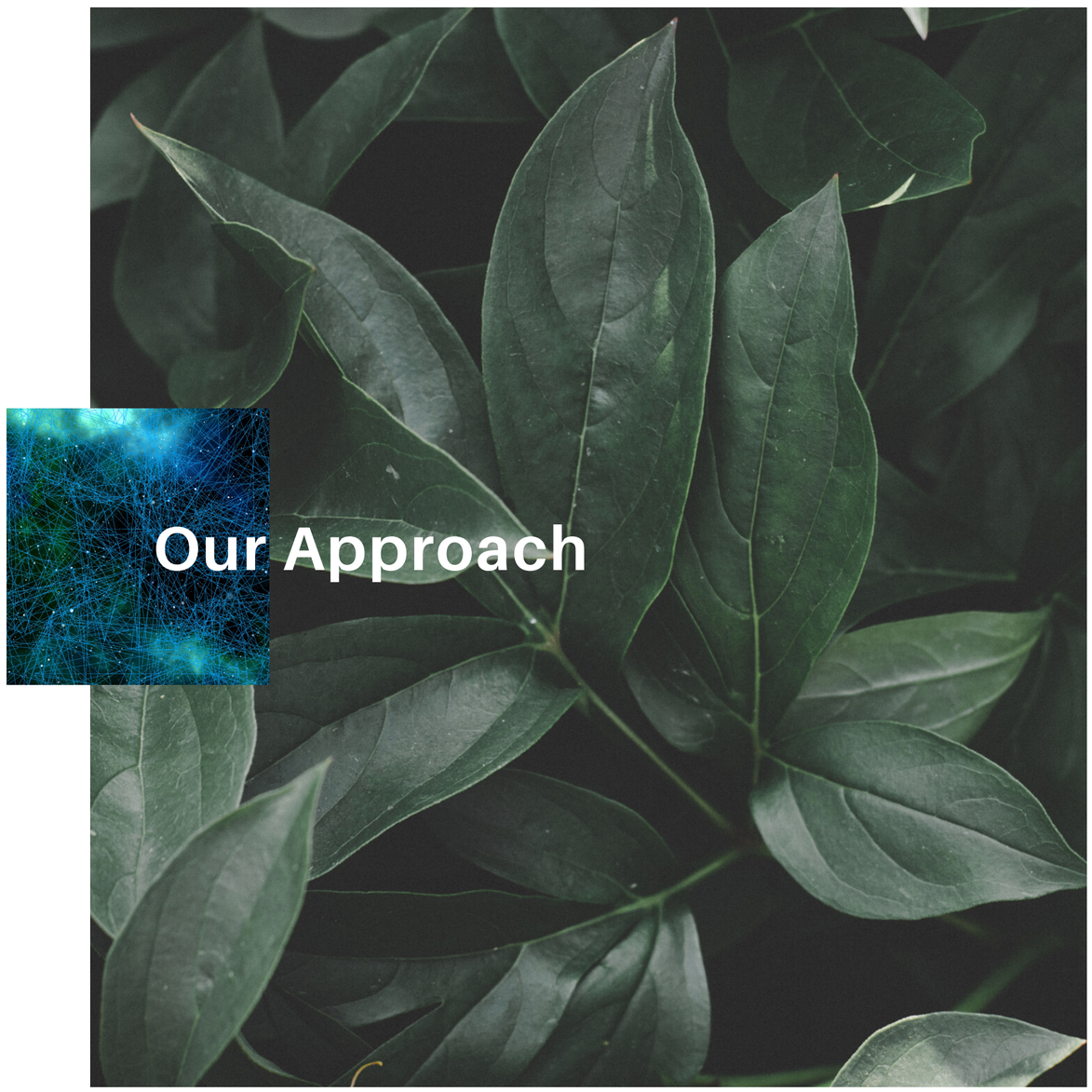
= 12 Million Americans

IOM reports approximately $750 billion is wasted on unnecessary services and other inefficiencies

Globally, patient care is behind in using data analytics as 'Active Assistive Technology'

ATTICUS hopes to change that





Creating a Healthier Hospital

What Is Possible

Reduce Diagnostic Errors & Assist in Diagnostics

.

Predict Spread of 'In-house' Infections

.

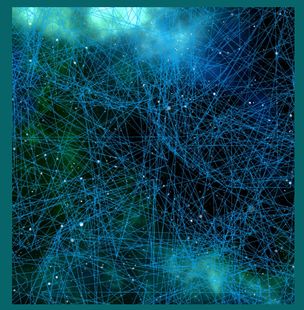
Optimize Clinical Outcomes

.

Improve Cost Effectiveness

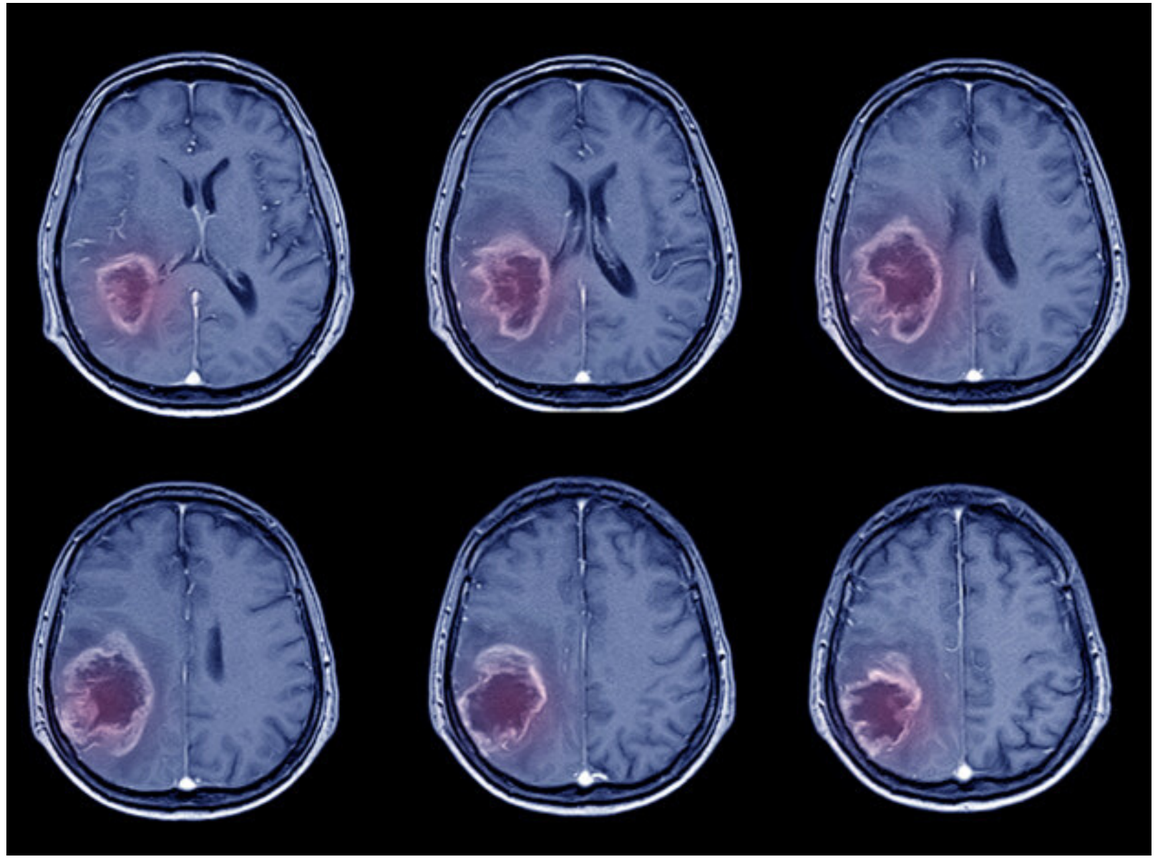
.

Track Patients to Predict Adverse Heath Incidents



1st Case Study

Intracranial Hemorrhage Detection



Identification of Acute Intracranial Hemorrhage and its Subtypes

Classification Problem

Tool of Choice

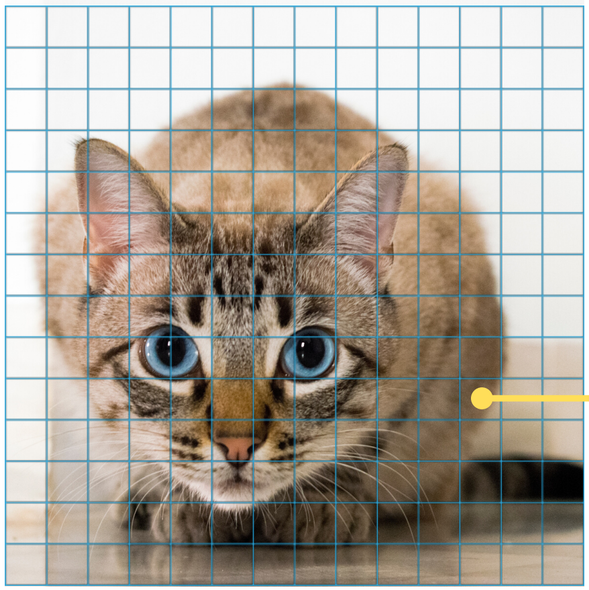
PyTorch

Open Source Machine Learning Library

Convolutional Neural Network

A class of deep neural networks.

Convolutional Neural Network



9	7	2	9
4	3	8	3
7	1	6	7
4	5	4	2

9	9
7	7

Image

Pixel Info

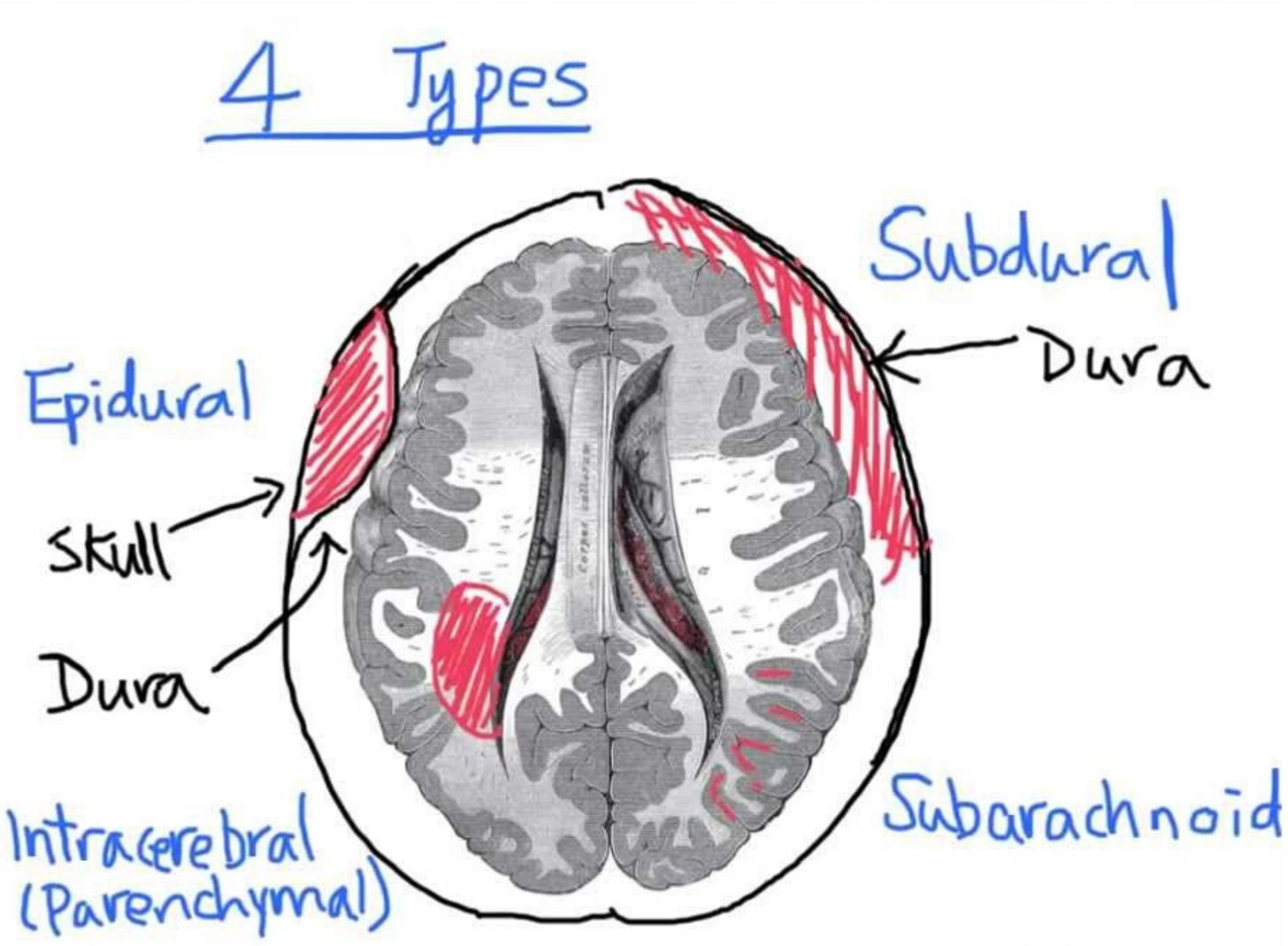
Feature

BACKGROUND

THE BRAIN IS EXTREMELY DELICATE

YET THIS SERIOUS HEALTH ISSUE REQUIRES RAPID AND INTENSIVE MEDICAL TREATMENT

Intracranial Hemorrhages



Dataset

Over 600,00 Images

Data Structure

Pre-labeled Data

Data Format

DICOM Images

Intraparenchymal

Subarachnoid

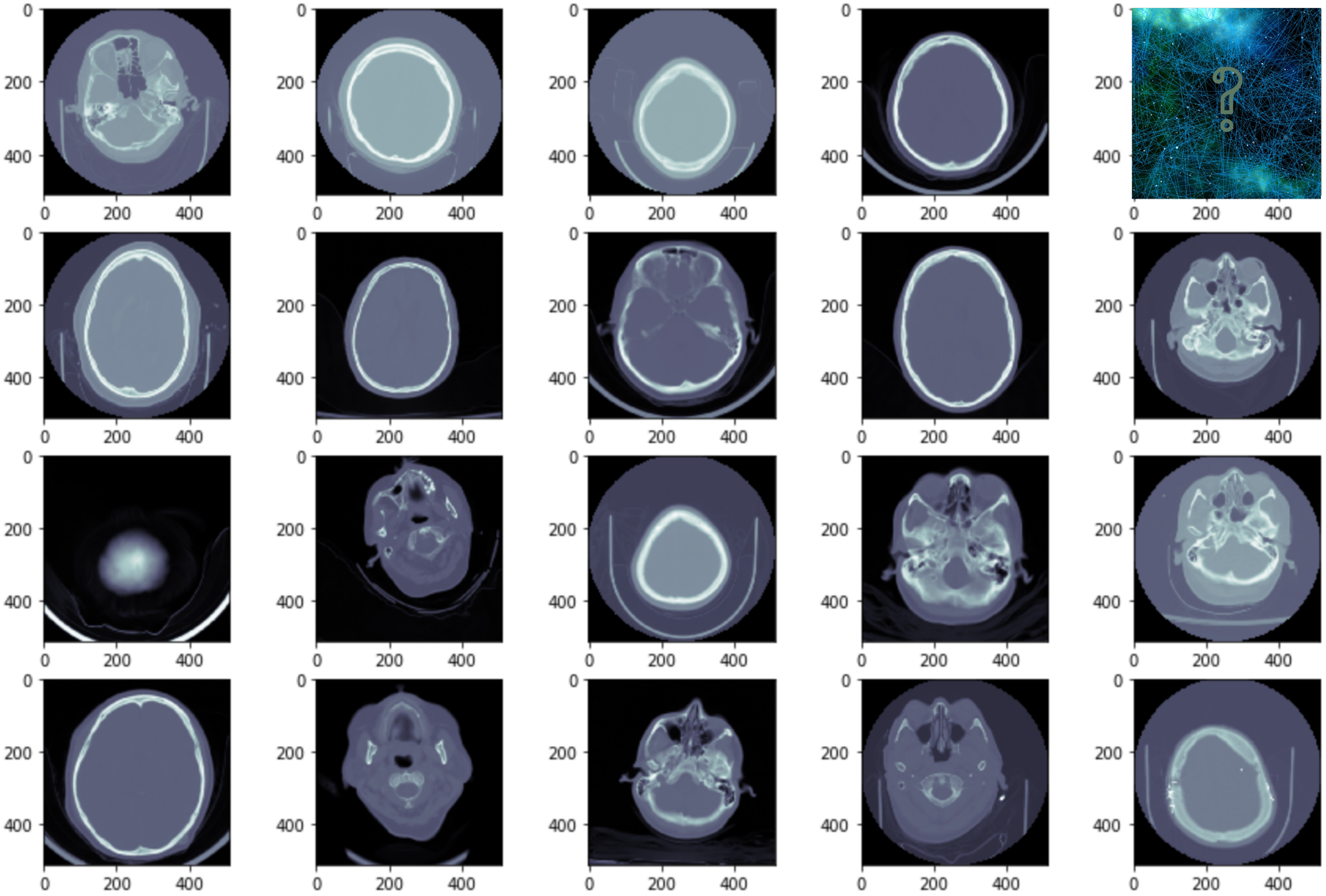
Subdural

Intraventricular

Epidural

FIRST FEW MODEL RUNS WERE FRUITLESS

I NEEDED TO LEARN MORE AND RETRACE MY STEPS

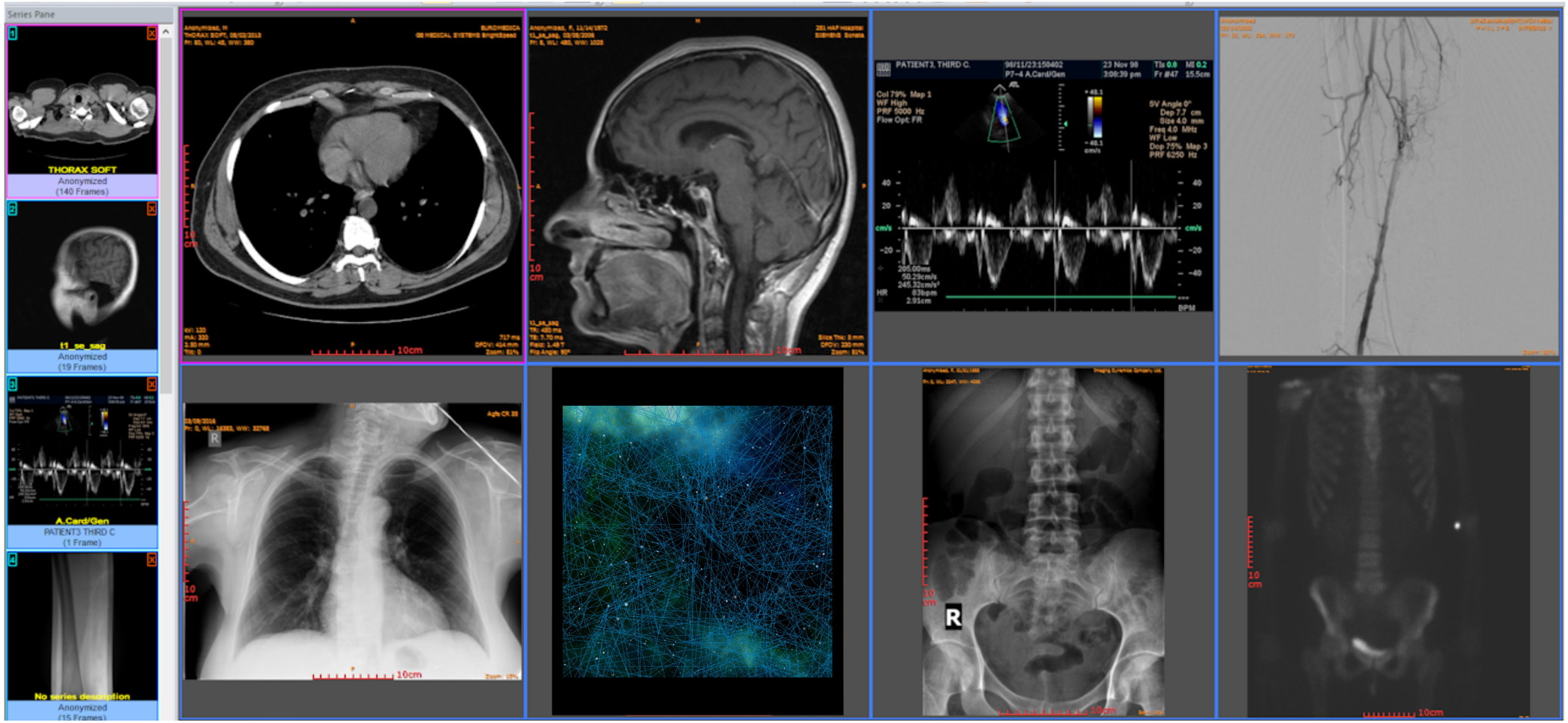


Are We Getting Enough Infomation

Initial Look

with domain knowledge the classification task becomes clear

UNDERSTANDING 

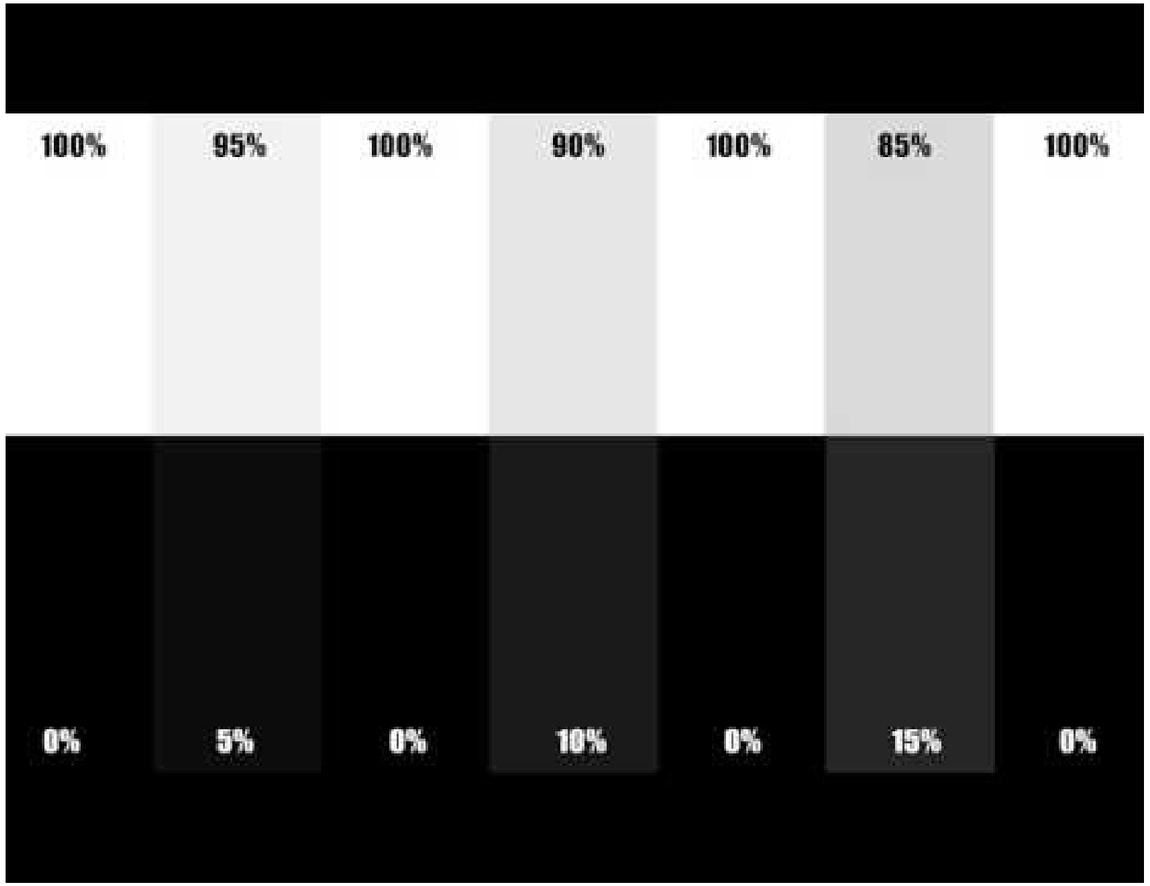


DICOM - DIGITAL IMAGING AND COMMUNICATIONS IN MEDICINE

IS A STANDARD FOR HANDLING, STORING, PRINTING, AND TRANSMITTING INFORMATION IN MEDICAL IMAGING.

VALUABLE LESSON LEARNED

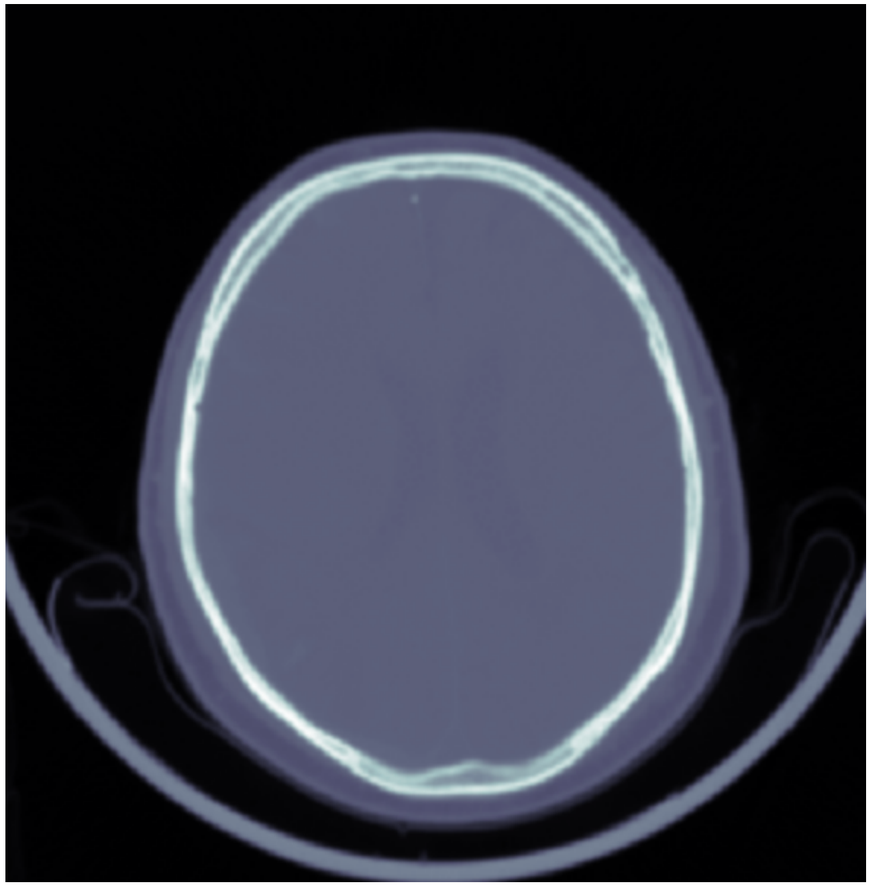
I NEEDED MY MODEL TO VIEW THE IMAGES LIKE A RADIOLOGIST VIEWS CT SCANS!! 😑



WINDOW

Brightness **of the image is adjusted via the window 'level'. The *contrast* is adjusted via the window 'width'.**

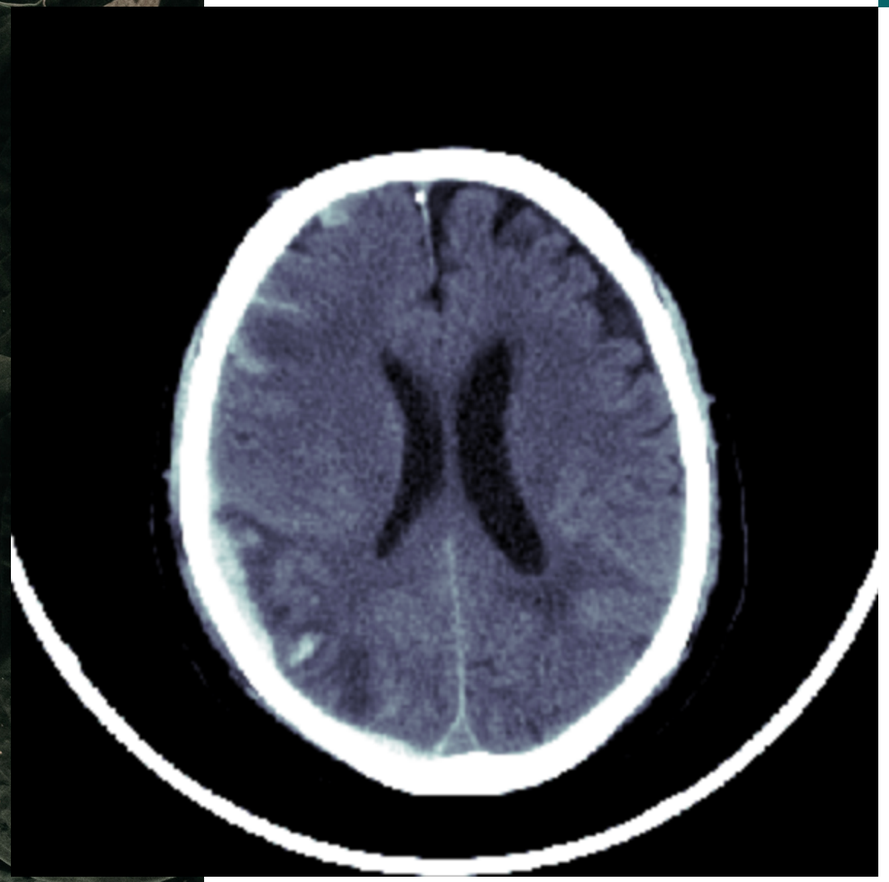
Before



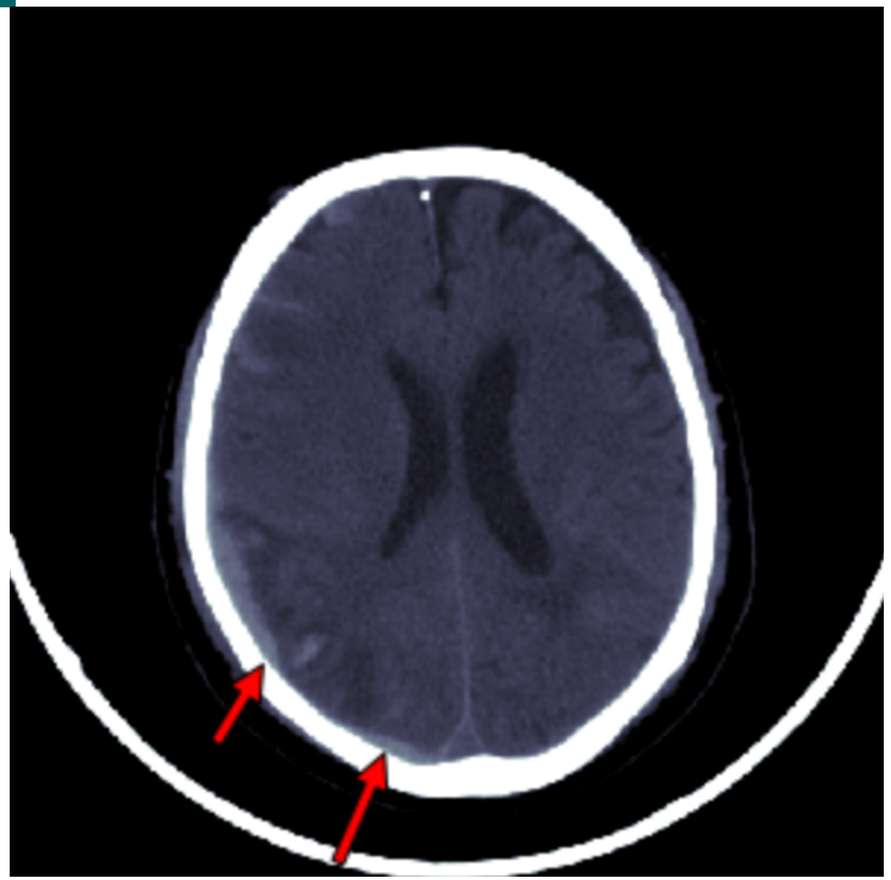
Window Range Head & Neck

* brain W:80 L:40
* subdural W:130-300 L:50-100
* stroke W:8 L:32 or W:40 L:40
* temporal bones W:2800 L:600
* soft tissues: W:350–400 L:20–60 4

After



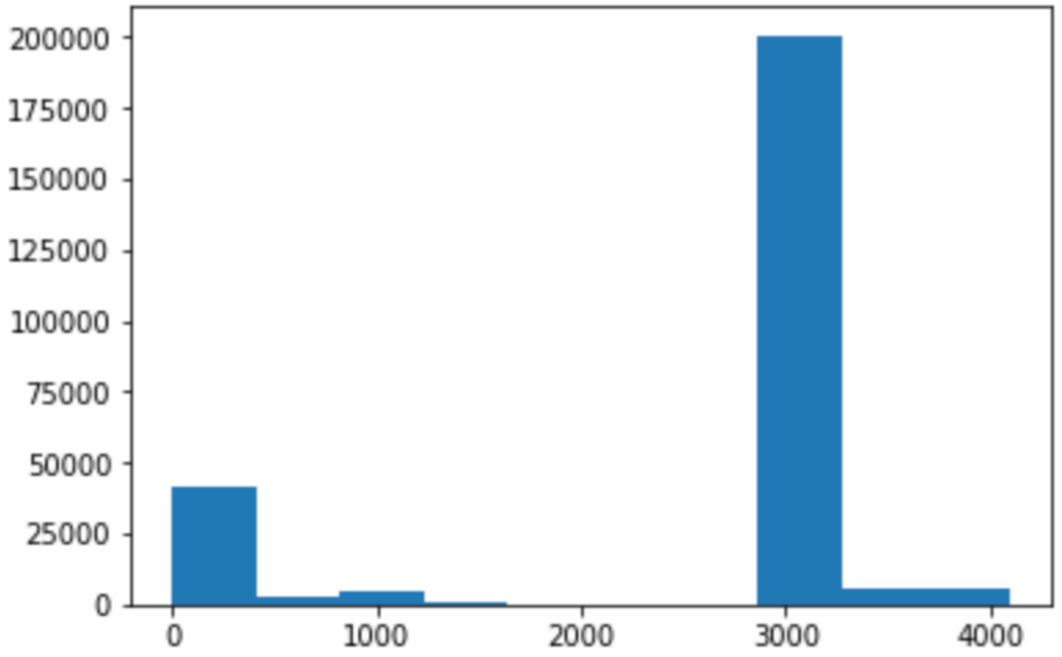
Brain Window



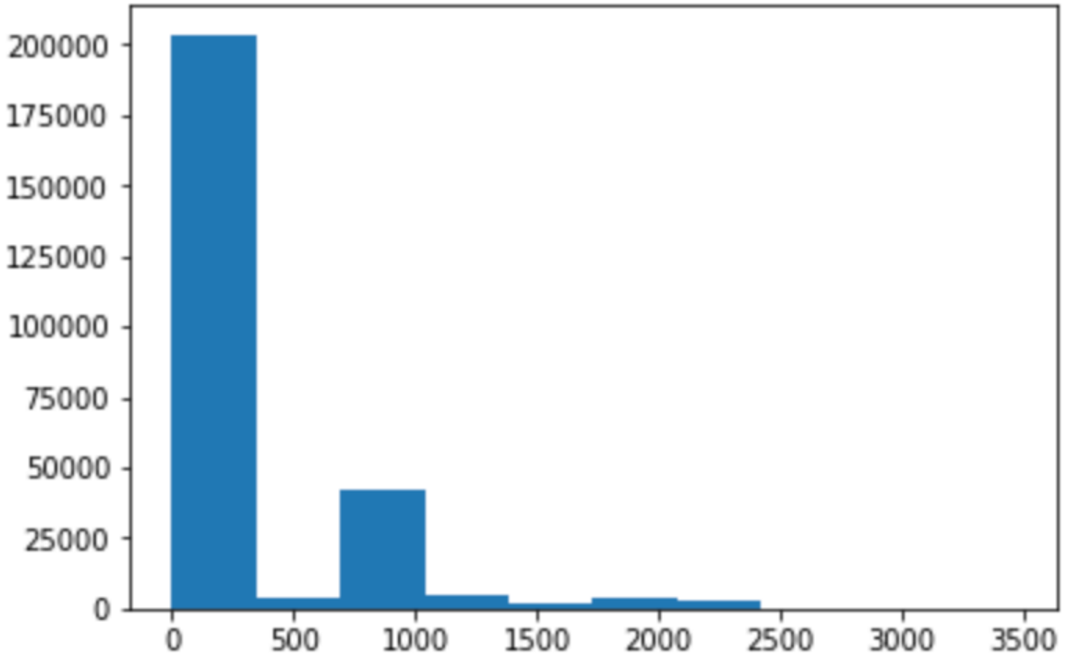
Bone Window

What's Next

```
dcm = dcms[2]
d = dcm.pixel_array
plt.hist(d.flatten());
```




```
plt.hist(dcm.pixel_array.flatten());
```



```
plt.hist(comb.img_pct_window,40);
```