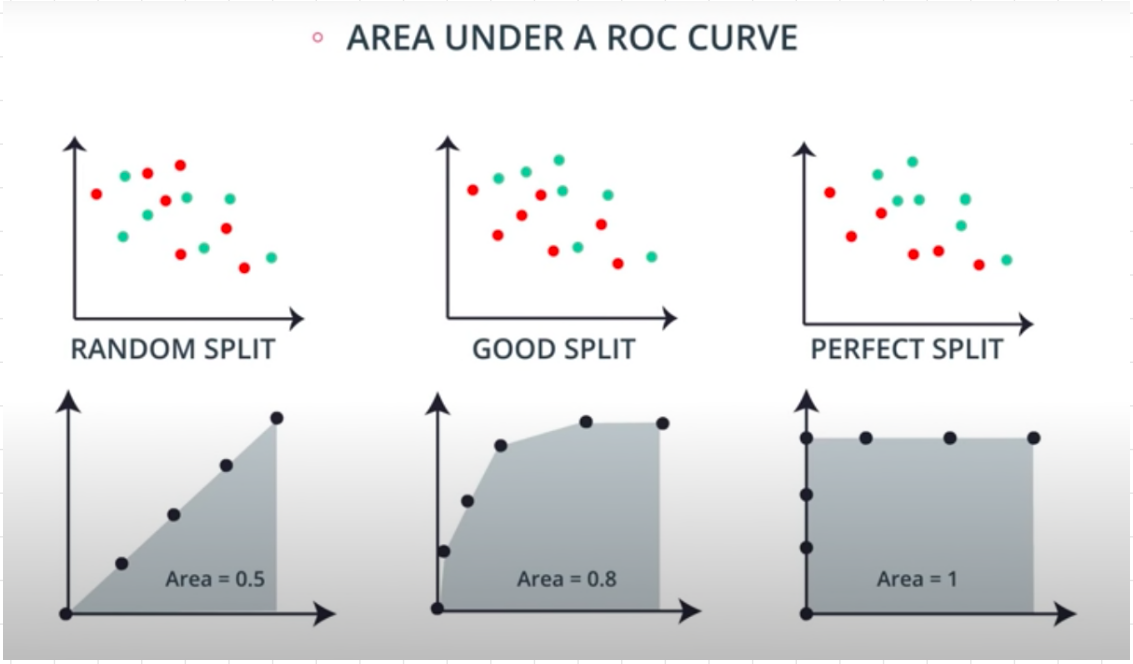
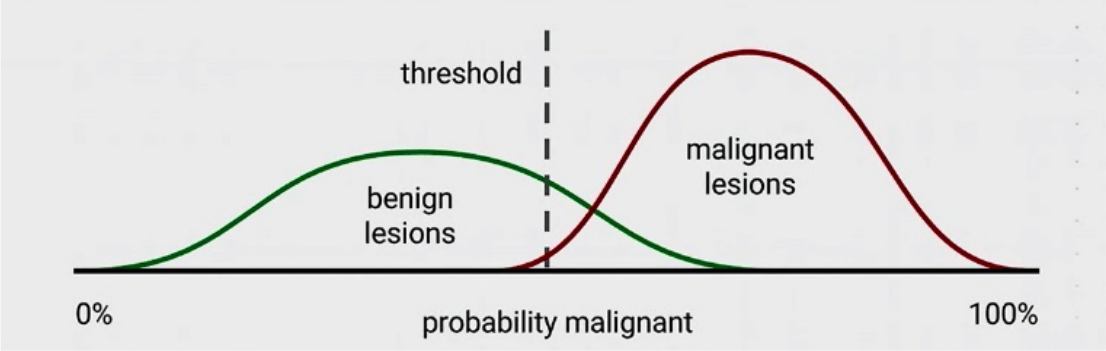
ROC Curve Refresher



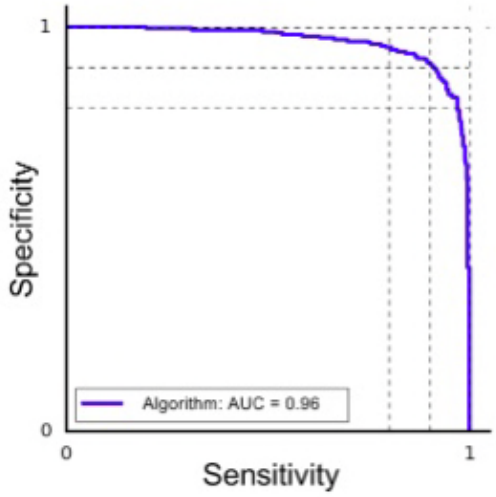
Sensitivity vs. Specificity



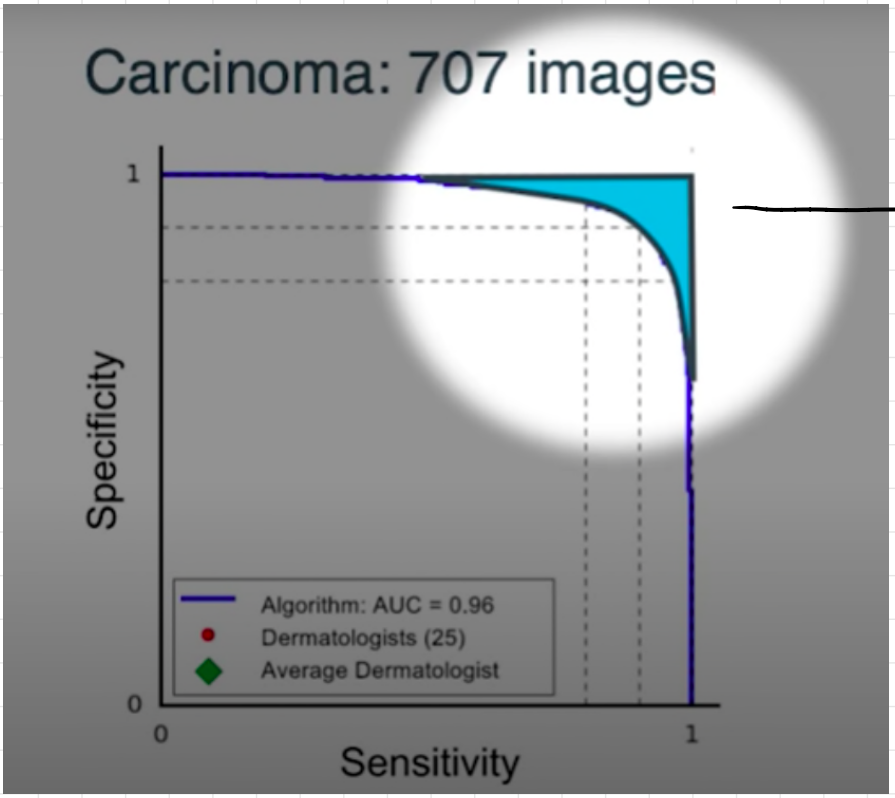
- Sensitivity: Out of all the malignant lesions, what percentage are to the right of the threshold (correctly classified)?
- Specificity: Out of all the benign lesions, what percentage are to the left of the threshold (correctly classified)?

Sensitivity: $\frac{\text{Correctly labeled, malignant}}{\text{Total labeled, malig.}}$

Specificity: $\frac{\text{Correctly labeled, benign}}{\text{Total labeled, benign}}$



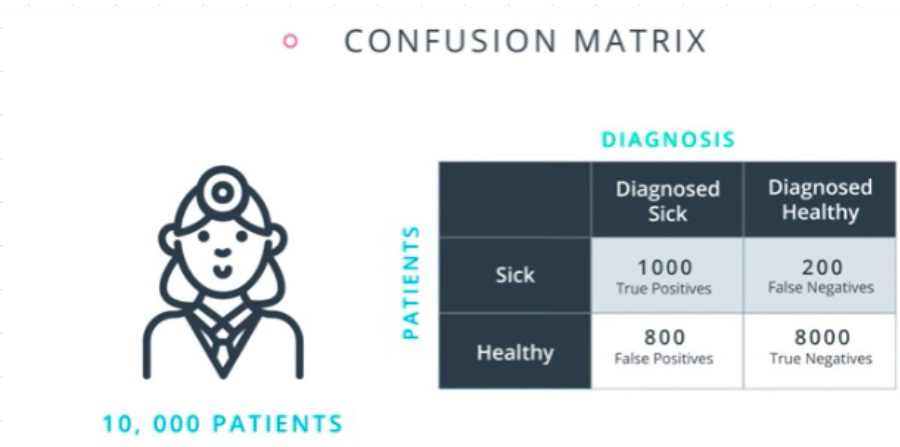
Examples.



→ Misclassi-fied

Confusion Matrix

	Diagnosed Sick	Diagnosed Healthy
Sick	True Positive	False Negative
Healthy	False Positive	True Negative

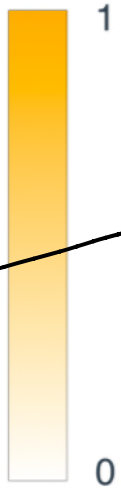


Type 1 Error: Misdiagnose a healthy one

Type 2 Error: Misdiagnose a sick one

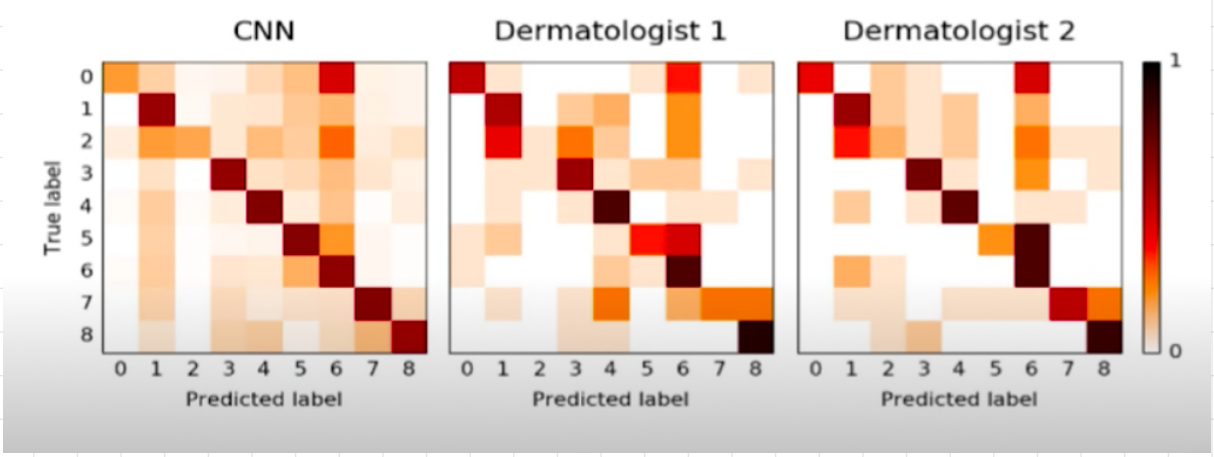
But confusion matrices can be much larger than 2×2. Here's an example of a larger one. Let's say we have three illnesses called A, B, C. And here is a confusion matrix:

	Predicted A	Predicted B	Predicted C
A	0.8	0.1	0.1
B	0.08	0.9	0.02
C	0.3	0.1	0.6



Prob of having B getting diagnosed as C

A confusion matrix for three types of illnesses: A, B, and C



CNN whoop whoop!

Many of us doing the same thing all over again, everyday.