**Cancer Imaging**

Neural Networks = deep learning

Learn end-to-end models for these tasks, particularly image classification

Image classification- given a set of discrete labels, computer sees a semantic gap with a big grid of values for each pixel

Prediction based on model and test\_data

test data, training data

Nearest Neighbor Classifier

Hyperparameters- choices about the algorithm that we set rather than learn, problem dependent and must try the all out and see what works best

Parameters or weights

In terms of mortality, it is the leading cause of death among women aged between 35 and 64 years, and is the leading cancer-related cause of death in the female population as a whole [[2,3]](http://www.sciencedirect.com/science/article/pii/S0895717710001378" \l "b2).

Backpropogation

You should have your algorithm accept inputs in one specific format

Maybe there is some sort of library that takes in the photo format that you specified; you can look at existing CV papers that utilize that photo format and figure out what photo loaders they used.

Breast screening is a method of detecting breast cancer at a very early stage. The first step involves taking an X-ray, called a mammogram, of each breast. The mammogram can detect small changes in breast tissue which may indicate cancers which are too small to be felt either by the woman herself or by a doctor.

The World Health Organisation’s International Agency for Research on Cancer (IARC) concluded that mammography screening for breast cancer reduces mortality. This means that out of every 500 women screened, one life will be saved.

Clustering techniques are largely recognized as being useful exploratory tools for breast cancer data analysis [[11–14]](http://www.sciencedirect.com/science/article/pii/S0895717710001378" \l "b11). Women showing similar expression patterns over a wide range of experimental conditions can be clustered together.

Support Vector Machines (SVM)

. A neural network generalizes from the input data to patterns inherent in the data, and its uses these patterns to make predictions or to classify.

However, the low positive predictive value of breast   
biopsy resulting from mammogram interpretation leads to approximately   
70% unnecessary biopsies with benign outcomes. To reduce the high   
number of unnecessary breast biopsies, several computer-aided diagnosis   
(CAD) systems have been proposed in the last years.

1. BI-RADS assessment: 1 to 5 (ordinal)

2. Age: patient's age in years (integer)

3. Shape: mass shape: round=1 oval=2 lobular=3 irregular=4 (nominal)

4. Margin: mass margin: circumscribed=1 microlobulated=2 obscured=3 ill-defined=4 spiculated=5 (nominal)

5. Density: mass density high=1 iso=2 low=3 fat-containing=4 (ordinal)

6. Severity: benign=0 or malignant=1 (binominal)

A random forest is an ensemble (group or combination) of tree’s that collectively vote for the most popular class (or feature) amongst them by cancelling out the noise.

Ensemble learning– ensemble means group or combination. Ensemble learning in the context of machine learning is referred to methods that generate many classifiers and aggregate their results. There are two well- known methods namely ‘boosting’ (Shapire et al, 1998) and ‘bagging’ (Brieman, 1996) of classification trees.