***Aim of the project:***

* To build a breast cancer prediction system from morphological data pertaining to cancerous and non-cancerous tumors in the breast.
* Build different types of classification models:
* K-nearest neighbor (KNN)
* Decision tree
* Support vector machine
* Logistic regression
* Artificial neural networks
* Give the students an intuition about the different types of models, and how to choose ML frameworks based on the dataset and the task at hand.
* Give the students an overview of deep learning

***Timeline:***

**5 weeks (7/27 — 8/30):**

* **Week-1 (7/27 — 8/2); Materials posted on 7/24:**
* Data preparation
* Week-2 **(8/3 — 8/9); Materials to be posted on 7/31**:
* Implementing a K-nearest neighbor classifier
* Implementing a Decision tree classifier
* Week-3 **(8/10 — 8/16); Materials to be posted on 8/7**:
* Implementing a support vector machine (SVM) classifier
* Implementing a Logistic Regression classifier
* Week-4 **(8/17 — 8/23); Materials to be posted on 8/14**:
* Implementing a simple artificial neural network for binary classification
* More on confusion matrices; hyperparameter tuning; choosing classifiers based on data and application
* Week-5 **(8/24 — 8/30); Materials to be posted on 8/21**:
  + Deep Learning—An Overview
    - Existing frameworks
    - Applications
    - Simple implementations and theoretical concepts
    - Promises for the future

***Programming language of instruction:* Matlab**

* Ease of use, especially for beginners
* In-built one-line code to implement ML models
* Vectorizable code
* Anyone who doesn’t have a subscription of Matlab is encouraged to install ***Octave***. All of the commands that we shall use on Matlab can also be ran on Octave. Octave is a great free substitute for Matlab.