1. Save all files in a folder
2. Prepocess the MWD using “***HMMdataPrepoc.R****”* in R ( Change the file location in the code, need to install packages changepoint and imputeTS)

* This code will initially clean the outliers due to rod change from the data.
* After eliminating the rod change data, do a changepoint analysis on percussion pressure to eliminate the pressure difference.
* Finally, it interpolates the data in every 1cm interval depth.

1. Save the new data in the folder ( change the file location in the last line of the code *HMMdataPrepoc.R* )
2. Use function ***hmm\_em***in MATLAB for Hidden Markov Models. (Input the file location and the file name. It has to be modified as the saved preprocessed data.)
   * ***forwbackJOINT*** is estimating the marginal probabilities through joint distribution using forward backward algorithm(Expectation step ).
   * ***maxlikl\_JOINTpar\_multi*** Estimates the maximum likelihood estimator or parameters mu , sigma and transition matrix P.(Maximization step)
   * ***forwbackVIT*** calculating the MAP estimator using estimated parameters though forward backward algorithm.