TEMPERATURE AND SPEED CONTROL LAB (TSC-LAB)

Practice 10: Data acquisition with square velocity input

https://tsc-lab.blogspot.com/2021/06/practice-10-data-acquisition-with.html

- Blog: https://tsc-lab.blogspot.com/
- GitHub: https://github.com/vasanza/TSC-Lab
- Matlab functions: https://github.com/vasanza/Matlab_Code
- IEEEDataPort: http://ieee-dataport.org/4138
- **TSC-LAB configurations**
- *int dutyCycleInitial = 255;*
- *int dutyCycleFinish = 0;*
- *int period = 13000;*
- *int cycles = 50;*
- *1 sample per second*

Raw dataset preparation

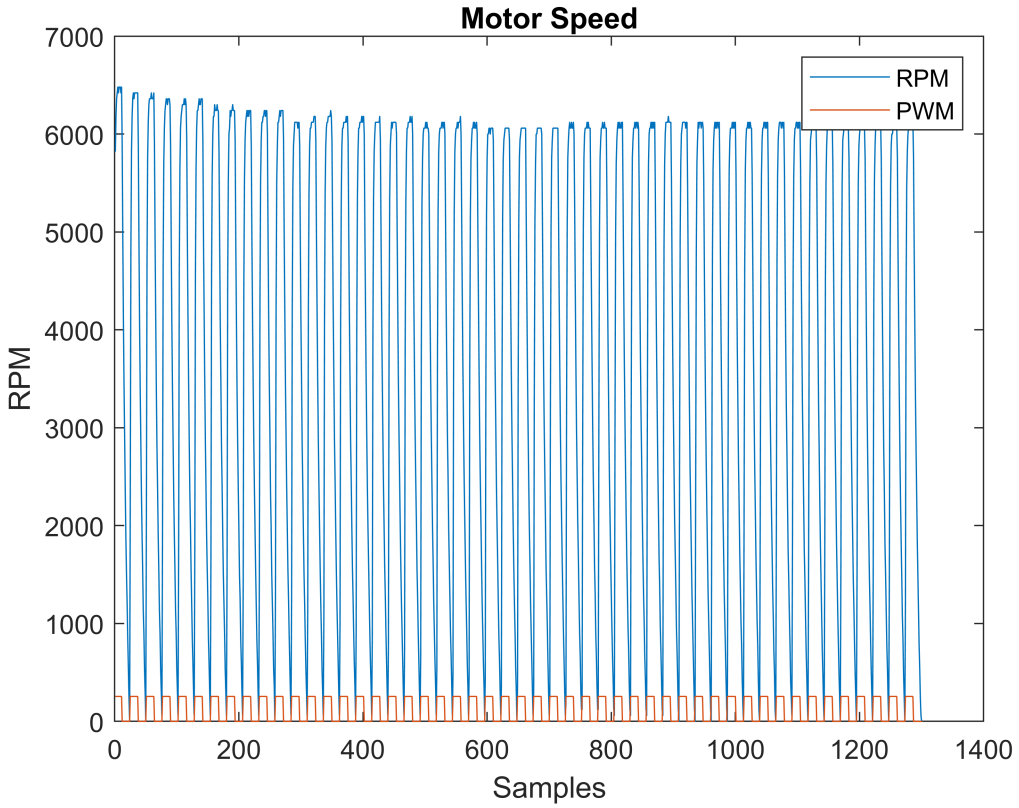
```
clear;clc;%clear all
addpath(genpath('./src'))%functions folders
datapath = fullfile('./data/');%data folder
```

Raw dataset preprocessing

```
filenames = FindCSV(datapath);%List All CSV files
data=readtable(fullfile(datapath,filenames(1).name));%Select i CSV file
data=table2array(data);
DataNorm = fNormalization(data(:,1));%Normalization
DataFeatures = [max(DataNorm) min(DataNorm) mean(DataNorm)...
    median(DataNorm) rms(DataNorm) std(DataNorm) ];%Feature extraction
```

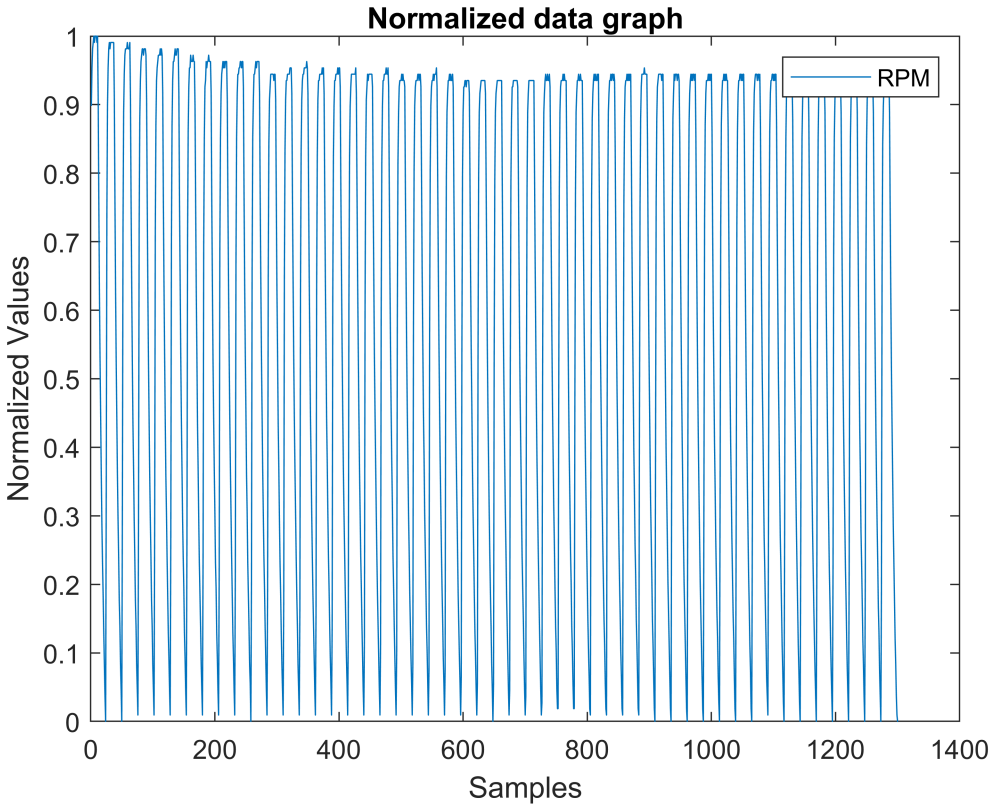
Plot Raw TSC-LAB dataset

```
figure
plot(data);xlabel('Samples');ylabel('RPM');
title('Motor Speed');
legend('RPM','PWM');
```



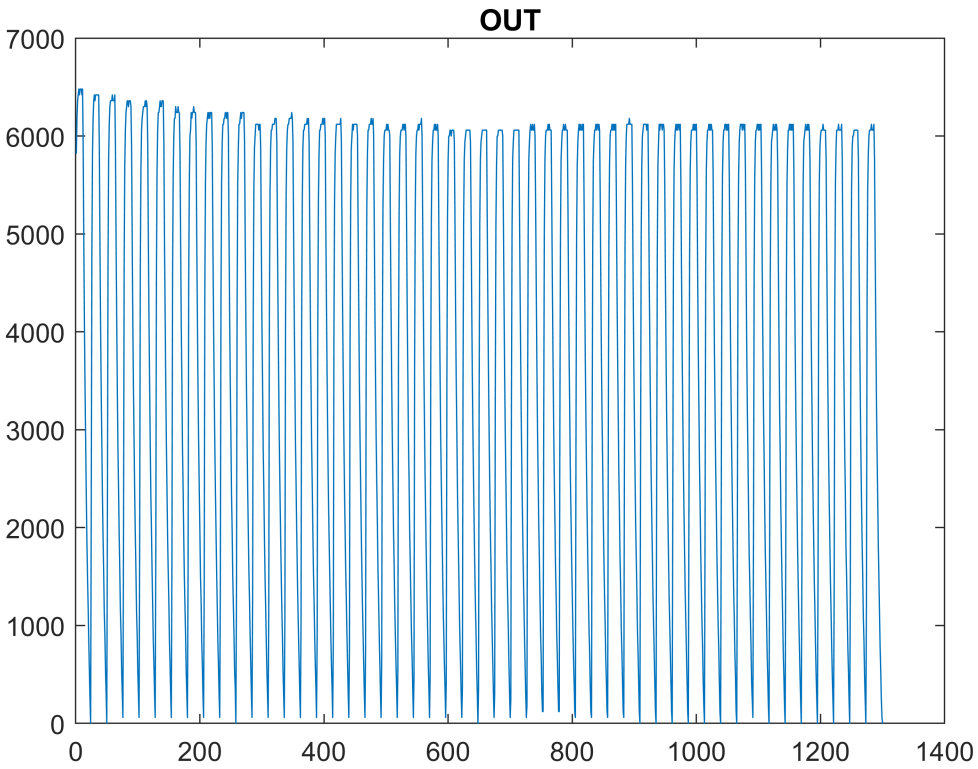
Plot Normalization dataset

```
figure
plot(DataNorm);xlabel('Samples');ylabel('Normalized Values');
title('Normalized data graph');
legend('RPM');
```



Select a case

```
IN=data(:,end);%temp1
OUT=data(:,1);%PWM1
figure
plot(OUT)
title('OUT');
```

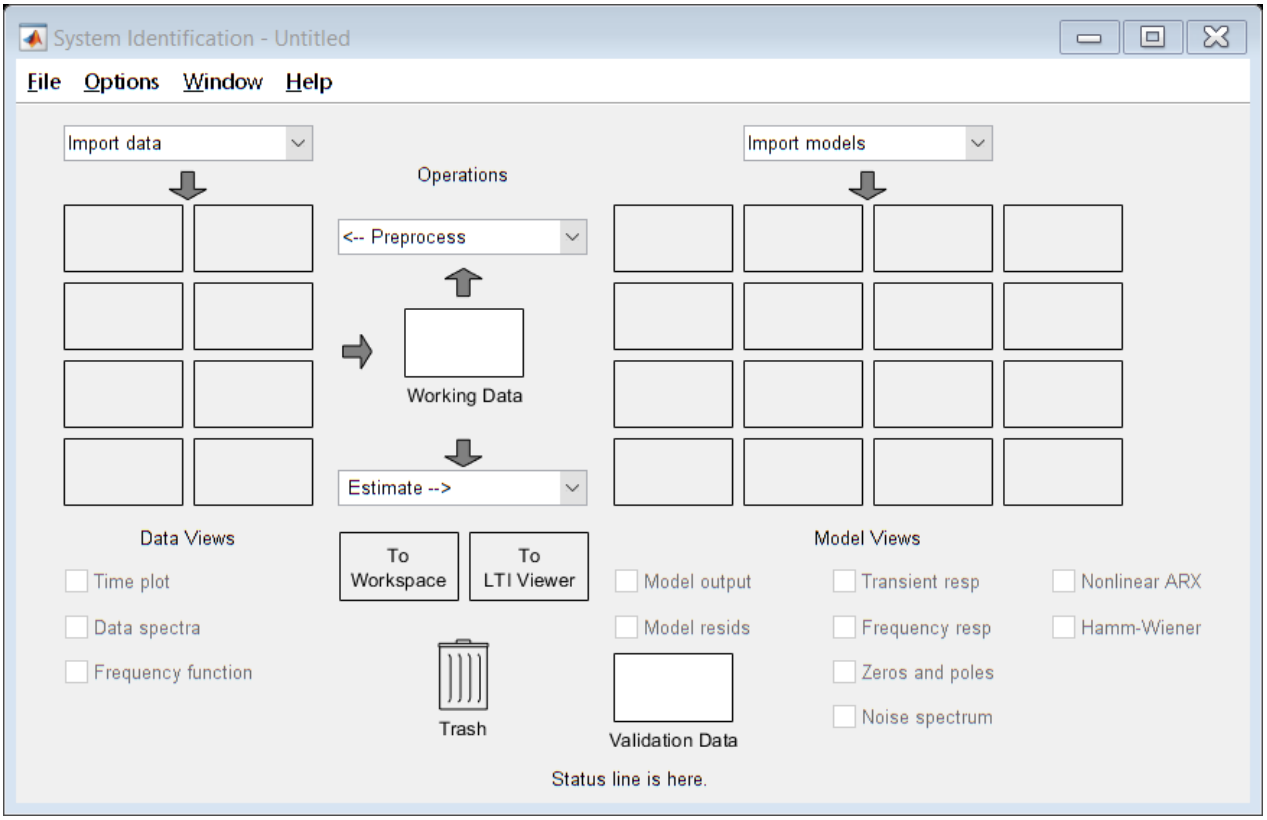


System Identification

```
ident
```

```
Warning: The "ident" command is obsolete and may be removed in a future release of MATLAB. Use the
"systemIdentification" command instead.

Created preference file C:\Users\vasan\Documents\MATLAB\idprefs.mat.
Type HELP MIDPREFS if you want to move this file.
```



Open the Classification Learner

```
%regressionLearner
%classificationLearner
```