**Introduction**

This file shows how to run the code and reproduce all the results in the attached paper from the zip file shared by the organization committee in a step-by-step manner.

**Data Preprocessing**

With the data (mat files) extracted from the zip file (IPC-SHM-P1.zip), the MATLAB code file (dataPreprocess.m) preprocesses the data following the procedures below:

1. suppressing the outliers in some data series
   1. code section: **%% Remove Outlier**
2. visualizing some example data series
   1. code section: **%% Data Visualization**
3. segmenting data into the appropriate time series for TSC in the two scenarios
   1. code sections:
      1. **%% Data Preparation: cable force (Scenario 1)**
      2. **%% Data Preparation: cable force ratio (Scenario 2)**
   2. all the data are saved as tsv files, which will be further formatted to be used in the LSTM-FCN model for TSC.

**Data Formatting**

Since the tsv files generated in MATLAB in **Data Preprocessing** cannot be directly used for TSC in the LSTM-FCN model, all of them are formatted using the program extract\_all\_datasets.py. The code funning this program can be found in the script dataFormatting.ipynb that can be run using Google Colab. All the resulting files will be saved in a folder named “\_data” and renamed to “data”.

**Model Training and Testing**

Model training and testing are implemented using the program main.ipynb that is run using Google Colab. It should be noted that when training or testing a model, the file name should be consistent (dataset\_map in line 85 in model\_training.py and model\_testing.py and TRAIN\_FILES and TEST\_FILES in utils\constants.py). For example, when training or testing using the cable force ratio prior to 2011, the dataset\_map in model\_training.py or model\_testing.py should be set as ('cfrPre2011', 0) with 0 being the data ID, and the TRAIN\_FILES and TEST\_FILES in utils\constants.py should be set as '../data//cfrPre2011\_TRAIN' and '../data//cfrPre2011\_TEST', respectively.

One more thing needs to be noted when testing the learned model. As an example, Scenario 1uses the cable force data series. The data prior to the year 2011 is used for training an LSTM-FCN model, that is data in the file “cfPre2011\_TRAIN”. When testing a time series data (e.g., cable force data on SJS11 in 2011 in the file “cf2011SJS11”) on the trained model, its file name needs to be temporarily changed to “cfPre2011\_TEST”. Similar operation needs to be conducted in Scenario 2. Additionally, since both models have been trained for the two scenarios considered in this study, they can be directly tested using the model parameters saved in the folder “weights” to reproduce the results presented in the attached paper.