**Lab Session – “HHT Code”**

Due Day: 2022/03/28, Monday, 23:59

Objective: To understand how to doing HHT process on Matlab

Explanations：

1. Given a sample set of driver’s raw data, use it to build HHT spectrum on Matlab
2. Do the preparation (HHT Lab Session PPT, page 3)
3. Copy this code to the Matlab worksheet and complete it according to the hint.

| **clc;**  **clear all;**    **% Load mat file (L1R1 and L1R0)**  ***Write a code to load a driver’s raw data (mat file)***  See HHT lab Session PPT, page 26  % declare empty variable  HHT\_data\_L1R1 = [];  HHT\_data\_L1R0 = [];  % for each sample (L1R1)  for i=1:length(driver\_data\_L1R1)  temp\_column = driver\_data\_L1R1{i}(:,2);    **% EMD process**  ***Write a code to do EMD process until get inst frequency and inst amplitude***  See HHT lab Session PPT, page 27  **% HHT Spectrum**  ***Write a code to do HHT Spectrum process until get amplitude power of each block (res\_ampl)***  See HHT lab Session PPT, page 28  **% concat all the data**  HHT\_data\_L1R1 = padconcatenation(HHT\_data\_L1R1, [res\_time res\_ampl'],1);  end  **%end for**  **% for each sample (L1R0)**  for i=1:length(driver\_data\_L1R0)  temp\_column = driver\_data\_L1R0{i}(:,2);    **% EMD process**  ***Write a code to do EMD process until get inst frequency and inst amplitude***  See HHT lab Session PPT, page 27  **% HHT Spectrum**  ***Write a code to do HHT Spectrum process until get amplitude power of each block (res\_ampl)***  See HHT lab Session PPT, page 28  **% concat all the data**  HHT\_data\_L1R0 = padconcatenation(HHT\_data\_L1R0, [res\_time res\_ampl'],1);  end  **%end for**  **% Visualization data**  figure  imagesc(HHT\_data\_L1R1(1:size(HHT\_data\_L1R1,1),2:25)');  set(gca,'YDir','normal'); caxis([-10 6]);  colorbar;  colormap('jet');  figure  imagesc(HHT\_data\_L1R0(1:size(HHT\_data\_L1R0,1),2:25)');  set(gca,'YDir','normal'); caxis([-10 6]);  colorbar;  colormap('jet');  **% save result to mat file**  save('HHT\_data\_L1R1.mat', 'HHT\_data\_L1R1');  save('HHT\_data\_L1R0.mat', 'HHT\_data\_L1R0'); |
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1. Use MATLAB to run the code and add screenshots to report in Word files.
2. Compress(.zip,.rar) the following file with the name of the group (e.g. group\_1.zip)
   * 1. Code(\*.m)
     2. Report(\*.doc)
        + Result of HHT Spectrum (table and figure).
        + Conclusion of result (analyze the difference of L1R1 and L1R0 HHT Spectrum and what is the beneficial of using HHT Spectrum).
3. To update the contents of report can be directly re-upload file with the name of version (e.g. Group\_1\_v2.zip)

Note：

1. Each group, one report
2. Upload the file before 23:59 on Monday (March 28th, 2022) on e-Learning site ([*https://eeclass.ncu.edu.tw*](https://eeclass.ncu.edu.tw/)) to complete.