CT.2306 : Signal & Systems II

Project Report:

Processing motion signals from a PTZ camera

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Abstract

Sum-up of the project

Contents

1 Data Visualization

Loading data

We first use *load('data-proj.mat')* to load variables from data file. Then using *whos* we can list all variables. We have their name and size. Here is the result :

```
>> whos
Name           Size                    Bytes   Class

omega          1x20001                160008   double
t              1x20001                160008   double
```
<center>Listing 1: Loaded variables</center>

Plotting the data

We can not use the signal as it is. Graphically it is impossible to analyze. Either it is too noisy or the window is too large in order to see enough details of the signal. This is a continous (analog) signal. Electronic control devices requires digital signals.
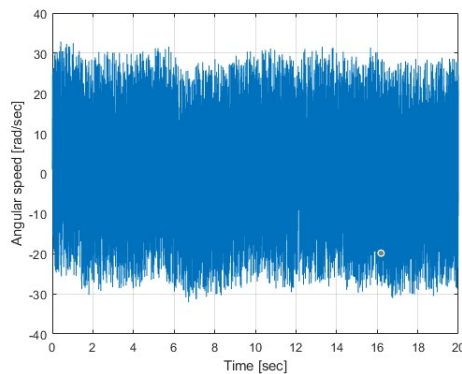

```
%% Plot of angular speed
fig=1
figure(fig)
plot()
grid on
xlabel('Time [sec]')
ylabel('Angular speed [rad/
    sec]')
```
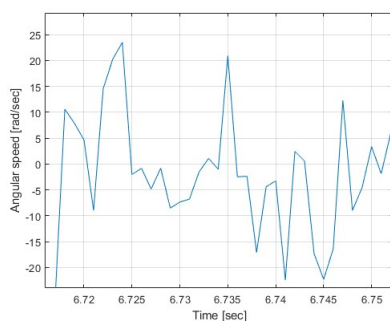<center>Listing 2: Code for Figure 2</center>

Figure 1: Angular speed as a function of time

2 Analog Filtering

Sampling period T_{e_1}

We deduce the Sampling period T_{e_1} with the subtraction of two consecutive values of t. Also, graphically we observe the run between 2 straight line in the signal if we zoom. $\mathbf{T_{e_1} = 1.10^{-3}sec}$


```
%% Sampling period
Te1=t(5)-t(4)

>>Te1 =

1.0000e-03
```
<center>Listing 3: Code for Figure 2</center>

Figure 2: Same signal with zoom

3   Sampling

4   Angular position and acceleration

5   Digital filtering