Lampiran 1

Script perekaman data dari modul data akuisisi

```
%Script to run data acquisition using National Instrument NI 9234
clear all;
clc;
close all;
tic;
s = daq.createSession('ni');
s.DurationInSeconds = 30;   % waktu merekam untuk 1 file
Dur = s.DurationInSeconds;
s.Rate = 17066;   % sampling rate (kecepatan sampling Hz)
s.addAnalogInputChannel('cDAQ1Mod1', 'ai0', 'Accelerometer');
s.addAnalogInputChannel('cDAQ1Mod1', 'ai1', 'Accelerometer');
%s.addAnalogInputChannel('cDAQ1Mod1', 'ai2', 'Accelerometer');
%s.addAnalogInputChannel('cDAQ1Mod1',    'ai3',    'Voltage');    %
Tachometer
%s.addAnalogInputChannel('cDAQ1Mod2', 'ai0', 'Microphone');
%s.addAnalogInputChannel('cDAQ1Mod2', 'ai1', 'Microphone');
s.Channels(1).Sensitivity    =    100.1E-3;    %mV/g    Type    4507B
serial:11165
s.Channels(2).Sensitivity    =    97.60E-3;    %mV/g    Type    4507B
serial:11026
%s.Channels(3).Sensitivity    =    99.56E-3;    %mV/g    Type    4507B
serial:10984
%s.Channels(4).Sensitivity = 94.50E-3;
%s.Channels(5).Sensitivity   =   9.40E-3;     %mV/Pa   Model   130B40
serial:41741
%s.Channels(6).Sensitivity   =   8.60E-3;     %mV/Pa   Model   130B40
serial:41842
for i=1:10          % banyaknya file yg direkam
data = s.startForeground();            % start recording vibration
data
data_ch1 = data(:,1);
data_ch2 = data(:,2);
%data_ch3 = data(:,3);
%data_ch4 = data(:,4);
```

```
%data_ch5 = data(:,5);
%data_ch6 = data(:,6);

rootname = 'D:\katup1A\';      % drive tujuan dan nama file
extension                          =                          '.mat';
% ekstension utk nama file
namafile = [rootname,'pompa_bukaan1',num2str(i),extension];
data_all = [data_ch1 data_ch2];
eval(['save ', namafile ,' data_all']);
pause(3)              % jeda waktu antar rekaman file
pesan = ['Acquiring and saving data at loop number: ',num2str(i)];
disp(pesan)
end
toc
```

Lampiran 2

Script untuuk FFT

```
clear
clc
close all
load('E:\Tugas akhir\Hasil_data\TA3\pompa_normal30.mat');
y=data_all(:,1);
%y=data_all(:,1);
sampling_rate=17066; %kecepatan sampling Hz
recording_time=30;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y = fft(y,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);
% plot amplitude time domain
figure
plot(y(1:2*17067))
title('domain waktu')
xlabel('time (milliseconds)')
ylabel('amplitudo (mv/g)')
axis([0 2072.79  -8 8])
```

```
% Plot single-sided amplitude spectrum.
figure
plot(f,2*abs(Y(1:NFFT/2+1)))
title('domain frekuensi')
xlabel('Frequency (Hz)')
ylabel('amplitudo (mv/g)')
axis([0 2000 0 0.6])
analy=hilbert(data_all(:,1));
%analy=hilbert(data_all(:,1));
y=abs(analy);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y = fft(y,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);
figure
plot(f,2*abs(Y(1:NFFT/2+1)))
title('Envelope Detection Using Hilbert Transform')
xlabel('Frequency (Hz)')
ylabel('|Y(f)|')
```

Lampiran 3

Script Parameter statistik

```
clear
clc
close all
for d=1:75
   signal_in=['E:\Tugas
akhir\Hasil_data\TA3\pompa_normal',int2str(d),'.mat'];
load (signal_in)
a=data_all(:,1);
M(d)=mean(a);
Z(d)=rms(a);
S(d)=std(a);
K(d)=kurtosis(a);
V(d)=var(a);
L(d)=skewness(a);
x=1:75;
end
```

```
%variasi tutupan 1
for di=1:75
signal_in=['C:\Users\Lenovo\Documents\katup1B\pompa_bukaan',int2st
r(di),'.mat'];
load (signal_in)
b=data_all(:,1);
M1(di)=mean(b);
Z1(di)=rms(b);
S1(di)=std(b);
K1(di)=kurtosis(b);
V1(di)=var(b);
L1(di)=skewness(b);
x1=1:75;
end
%variasi tutupan 2
for dii=1:75
   signal_in=['E:\Tugas
akhir\Hasil_data\katup2B\pompa_2bukaan',int2str(dii),'.mat'];
load (signal_in)
c=data_all(:,1);
M2(dii)=mean(c);
Z2(dii)=rms(c);
S2(dii)=std(c);
K2(dii)=kurtosis(c);
V2(dii)=var(c);
L2(dii)=skewness(c);
x2=1:75;
end
%variasi tutupan 3
for diii=1:75
   signal_in=['E:\Tugas
akhir\Hasil_data\katup3B\pompa_3bukaan',int2str(diii),'.mat'];
load (signal_in)
e=data_all(:,1);
M3(diii)=mean(e);
Z3(diii)=rms(e);
S3(diii)=std(e);
K3(diii)=kurtosis(e);
```

```
V3(diii)=var(e);
L3(diii)=skewness(e);
x3=1:75;
end
%variasi tutupan 4
for div=1:75
   signal_in=['E:\Tugas
akhir\Hasil_data\katup4B\pompa_4bukaan',int2str(div),'.mat'];
load (signal_in)
f=data_all(:,1);
M4(div)=mean(f);
Z4(div)=rms(f);
S4(div)=std(f);
K4(div)=kurtosis(f);
V4(div)=var(f);
L4(div)=skewness(f);
x4=1:75;
end
%level 1
figure
s=75;
c='r';
scatter(x,(L),s,c,'fill');
hold on
s=75;
c='b';
scatter(x1,(L1),s,c,'fill');
title('Grafik (a)')
%level 2
figure
s=75;
c='r';
scatter(x,(L),s,c,'fill');
hold on
s=75;
c='b';
scatter(x2,(L2),s,c,'fill');
title('Grafik (b)')
```

```
%level 3
figure
s=75;
c='r';
scatter(x,(L),s,c,'fill');
hold on
s=75;
c='b';
scatter(x3,(L3),s,c,'fill');
title('Grafik (c)')
%level 4
figure
s=75;
c='r';
scatter(x,(L),s,c,'fill');
hold on
s=75;
c='b';
scatter(x4,(L4),s,c,'fill');
title('Grafik (d)')
```