LAMPIRAN

UCAPAN TERIMA KASIH

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Script Matlab Pengambilan Data

Bantalan Normal

```
%Script to run data acquisition using National Instrument NI 9234
%Created: Oct 2016, Berli Kamiel

clear all;
clc;
close all;


tic;

s = daq.createSession('ni');
s.DurationInSeconds = 20;        %durasi rekaman
Dur = s.DurationInSeconds;
s.Rate = 51200;                  %sampling rate Hz
s.addAnalogInputChannel('cDAQ1Mod1', 'ai0', 'Accelerometer');
s.addAnalogInputChannel('cDAQ1Mod1', 'ai1', 'Accelerometer');

s.Channels(1).Sensitivity = 100.1E-3; %V/g Type 4507B serial:30171
s.Channels(2).Sensitivity = 97.60E-3; %V/g Type 4507B serial:11026


for i=1:30                       %  jumlah file yang diinginkan

data = s.startForeground();           % start recording vibration
data
data_ch1 = data(:,1);
data_ch2 = data(:,2);

rootname =
'E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\NORMAL1000RPM';
% drive tujuan dan nama file
extension = '.mat';
% ekstension utk nama file
namafile = [rootname,'bearing',num2str(i),extension];
data_all = [data_ch1 data_ch2];
eval(['save ', namafile ,' data_all']);

pause(3)
pesan = ['Acquiring and saving data at loop number: ',num2str(i)];
disp(pesan)
end

toc
```

rootname : diganti tempat yang digunakan untuk menyimpan file.

Bantalan Cacat Multi Jenis

```
%Script to run data acquisition using National Instrument NI 9234
%Created: Oct 2016, Berli Kamiel
```

```
clear all;
clc;
close all;


tic;

s = daq.createSession('ni');
s.DurationInSeconds = 20;        %durasi rekaman
Dur = s.DurationInSeconds;
s.Rate = 51200;                  %sampling rate Hz
s.addAnalogInputChannel('cDAQ1Mod1', 'ai0', 'Accelerometer');
s.addAnalogInputChannel('cDAQ1Mod1', 'ai1', 'Accelerometer');

s.Channels(1).Sensitivity = 100.1E-3; %V/g Type 4507B serial:30171
s.Channels(2).Sensitivity = 97.60E-3; %V/g Type 4507B serial:11026


for i=1:30                       %  jumlah file yang diinginkan

data = s.startForeground();            % start recording vibration
data
data_ch1 = data(:,1);
data_ch2 = data(:,2);

rootname =
'E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_CACAT_MULTI\CACAT1000RPM
';      % drive tujuan dan nama file
extension = '.mat';
% ekstension utk nama file
namafile = [rootname,'bearing',num2str(i),extension];
data_all = [data_ch1 data_ch2];
eval(['save ', namafile ,' data_all']);

pause(3)
pesan = ['Acquiring and saving data at loop number: ',num2str(i)];
disp(pesan)
end

toc
```

rootname : diganti tempat yang digunakan untuk menyimpan file.

Script Domain Waktu Bantalan Normal pada 4 Variasi Kecepatan

```
clear
clc
close

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1000RP
M\Normal1000RPMbearing1.mat')
y1=data_all(:,1);
```

```
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1200RPM\Normal2000RPMbearing1.mat')
y2=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1400RPM\Normal1400RPMbearing5.mat')
y3=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1600RPM\Normal1600RPMbearing19.mat')
y4=data_all(:,1);

% plot amplitude time domain
figure
subplot(2,2,1)
plot(y1(1:51200))
axis ([0 9909 -10 10]);
title('(a) 1000 rpm')
xlabel('time (milliseconds)')
ylabel('Amplitudo')

subplot(2,2,2)
plot(y2(1:51200))
axis ([0 8170 -10 10]);
title('(b) 1200 rpm')
xlabel('time (milliseconds)')
ylabel('Amplitudo')

subplot(2,2,3)
plot(y3(1:51200))
axis ([0 7013 -10 10]);
title('(c) 1400 rpm')
xlabel('time (milliseconds)')
ylabel('Amplitudo')

subplot(2,2,4)
plot(y4(1:51200))
axis ([0 6193 -10 10]);
title('(d) 1600 rpm')
xlabel('time (milliseconds)')
ylabel('Amplitudo')
```

Script Domain Waktu Bantalan Cacat Multi Jenis Pada 4 Variasi Putaran

```
clear
clc
close

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1000RPM\Multi1000RPMbearing30.mat')
y1=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1200RPM\Multi1200RPMbearing27.mat')
y2=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1400RPM\Multi1400RPMbearing7.mat')
y3=data_all(:,1);
```

```
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1600RPM\M
ulti1600RPMbearing7.mat')
y4=data_all(:,1);

% plot amplitude time domain
figure
subplot(2,2,1)
plot(y1(1:51200))
axis ([0 33032 -55 55]);
title('(a) 1000 rpm')
xlabel('time (milliseconds)')
ylabel('Amplitudo')

subplot(2,2,2)
plot(y2(1:51200))
axis ([0 27234 -55 55]);
title('(b) 1200 rpm')
xlabel('time (milliseconds)')
ylabel('Amplitudo')

subplot(2,2,3)
plot(y3(1:51200))
axis ([0 23378 -55 55]);
title('(c) 1400 rpm')
xlabel('time (milliseconds)')
ylabel('Amplitudo')

subplot(2,2,4)
plot(y4(1:51200))
axis ([0 20645 -55 55]);
title('(d) 1600 rpm')
xlabel('time (milliseconds)')
ylabel('Amplitudo')
```

Script Domain Frekuensi Bantalan Normal Pada 4 Variasi Kecepatan

```
clear
clc
close

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1000RP
M\Normal1000RPMbearing7.mat')
y1=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1200RP
M\Normal2000RPMbearing27.mat')
y2=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1400RP
M\Normal1400RPMbearing7.mat')
y3=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1600RP
M\Normal1600RPMbearing29.mat')
y4=data_all(:,1);
```

```
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %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
Y1 = fft(y1,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y2 = fft(y2,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y3 = fft(y3,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y4 = fft(y4,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);


% Plot single-sided amplitude spectrum.
subplot (2,2,1)
plot(f,2*abs(Y1(1:NFFT/2+1)))
axis ([0 2000 0 0.05]);
title('(a) 1000 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot (2,2,2)
plot(f,2*abs(Y2(1:NFFT/2+1)))
axis ([0 2000 0 0.05]);
title('(b) 1200 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot (2,2,3)
plot(f,2*abs(Y3(1:NFFT/2+1)))
axis ([0 2000 0 0.05]);
title('(c) 1400')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot (2,2,4)
plot(f,2*abs(Y4(1:NFFT/2+1)))
axis ([0 2000 0 0.05]);
title('(d) 1600')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```

Script Domain Frekuensi Bantalan Cacat Multi Jenis Pada 4 Variasi Putaran

```
clear
clc
close

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1000RPM\M
ulti1000RPMbearing30.mat')
```

```
y1=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1200RPM\M
ulti1200RPMbearing27.mat')
y2=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1400RPM\M
ulti1400RPMbearing7.mat')
y3=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1600RPM\M
ulti1600RPMbearing29.mat')
y4=data_all(:,1);


sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %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
Y1 = fft(y1,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y2 = fft(y2,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y3 = fft(y3,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y4 = fft(y4,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);


% Plot single-sided amplitude spectrum.
subplot (2,2,1)
plot(f,2*abs(Y1(1:NFFT/2+1)))
axis ([0 1500 0 0.1]);
title('(a) 1000 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot (2,2,2)
plot(f,2*abs(Y2(1:NFFT/2+1)))
axis ([0 1500 0 0.1]);
title('(b) 1200 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot (2,2,3)
plot(f,2*abs(Y3(1:NFFT/2+1)))
axis ([0 1500 0 0.1]);
title('(c) domain 1400')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot (2,2,4)
plot(f,2*abs(Y4(1:NFFT/2+1)))
axis ([0 1500 0 0.1]);
```

```
title('(d) domain 1600')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```

Script Spektrum *Envelope* Bantalan Normal Pada 4 Variasi Kecepatan

```
clear
clc
close

sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1000RP
M\Normal1000RPMbearing30.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n1=sig_f/(norm(sig_f));
freq_s1=(0:L-1)/T;

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1200RP
M\Normal2000RPMbearing27.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n2=sig_f/(norm(sig_f));
freq_s2=(0:L-1)/T;

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1400RP
M\Normal1400RPMbearing7.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n3=sig_f/(norm(sig_f));
freq_s3=(0:L-1)/T;

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1600RP
M\Normal1600RPMbearing7.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n4=sig_f/(norm(sig_f));
freq_s4=(0:L-1)/T;

% envelope analysis based on Hilbert transform
figure
subplot(2,2,1);
plot(freq_s1,sig_n1);
axis ([0 1500 0 0.05]);
title('(a) 1000 rpm')
```

```
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot(2,2,2);
plot(freq_s2,sig_n2);
axis ([0 1500 0 0.05]);
title('(b) 1200 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot(2,2,3);
plot(freq_s3,sig_n3);
axis ([0 1500 0 0.05]);
title('(c) 1400 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot(2,2,4);
plot(freq_s4,sig_n4);
axis ([0 1500 0 0.05]);
title('(d) 1600 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```

Script Spektrum Envelope Bantalan Cacat Cacat Multi Jenis Pada 4 Variasi Kecepatan

```
clear
clc
close

sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1000RPM\M
ulti1000RPMbearing30.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n1=sig_f/(norm(sig_f));
freq_s1=(0:L-1)/T;

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1200RPM\M
ulti1200RPMbearing27.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n2=sig_f/(norm(sig_f));
freq_s2=(0:L-1)/T;

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1400RPM\M
ulti1400RPMbearing7.mat')
```

```
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n3=sig_f/(norm(sig_f));
freq_s3=(0:L-1)/T;

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1600RPM\M
ulti1600RPMbearing29.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n4=sig_f/(norm(sig_f));
freq_s4=(0:L-1)/T;

% envelope analysis based on Hilbert transform
figure
subplot(2,2,1);
plot(freq_s1,sig_n1);
axis ([0 1500 0 0.2]);
title('(a) 1000 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot(2,2,2);
plot(freq_s2,sig_n2);
axis ([0 1500 0 0.2]);
title('(b) 1200 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot(2,2,3);
plot(freq_s3,sig_n3);
axis ([0 1500 0 0.2]);
title('(c) 1400 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot(2,2,4);
plot(freq_s4,sig_n4);
axis ([0 1500 0 0.2]);
title('(d) 1600 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```

Script Hasil Plot Domain Frekuensi dan *Envelope* Pada Kecepatan Poros 1000 RPM

```
clear
clc
close

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1000RP
M\Normal1000RPMbearing7.mat')
y1=data_all(:,1);
```

```
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1000RPM\M
ulti1000RPMbearing30.mat')
y2=data_all(:,1);

%frekuensi normal
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %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
Y1 = fft(y1,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);

figure
subplot (3,1,1)
plot(f,2*abs(Y1(1:NFFT/2+1)))
axis ([0 800 0 0.2]);
title('(a) 1000 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

%frekuensi cacat
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y2 = fft(y2,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);

subplot (3,1,2)
plot(f,2*abs(Y2(1:NFFT/2+1)))
axis ([0 800 0 0.2]);
title('(b) 1000 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

%envelope cacat
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1000RPM\M
ulti1000RPMbearing30.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n1=sig_f/(norm(sig_f));
freq_s1=(0:L-1)/T;

subplot(3,1,3);
plot(freq_s1,sig_n1);
axis ([0 800 0 0.2]);
title('(c) 1000 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```

Script Hasil Plot Domain Frekuensi dan *Envelope* Pada Kecepatan Poros 1200 RPM

```
clear
clc
close
```

```
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1200RPM\Normal2000RPMbearing27.mat')
y1=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1200RPM\Multi1200RPMbearing27.mat')
y2=data_all(:,1);

%frekuensi normal
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %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
Y1 = fft(y1,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);

figure
subplot (3,1,1)
plot(f,2*abs(Y1(1:NFFT/2+1)))
axis ([0 800 0 0.2]);
title('(a) 1200 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

%frekuensi cacat
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y2 = fft(y2,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);


subplot (3,1,2)
plot(f,2*abs(Y2(1:NFFT/2+1)))
axis ([0 800 0 0.2]);
title('(b) 1200 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

%envelope cacat
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1200RPM\Multi1200RPMbearing27.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n1=sig_f/(norm(sig_f));
freq_s1=(0:L-1)/T;

subplot(3,1,3);
plot(freq_s1,sig_n1);
axis ([0 800 0 0.2]);
title('(c) 1200 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```

Script Hasil Plot Domain Frekuensi dan *Envelope* Pada Kecepatan Poros 1400 RPM

```
clear
clc
close

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1400RPM\Normal1400RPMbearing7.mat')
y1=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1400RPM\Multi1400RPMbearing7.mat')
y2=data_all(:,1);

%frekuensi normal
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %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
Y1 = fft(y1,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);

figure
subplot (3,1,1)
plot(f,2*abs(Y1(1:NFFT/2+1)))
axis ([0 800 0 0.2]);
title('(a) 1400 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

%frekuensi cacat
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y2 = fft(y2,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);

subplot (3,1,2)
plot(f,2*abs(Y2(1:NFFT/2+1)))
axis ([0 800 0 0.2]);
title('(b) 1400 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

%envelope cacat
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1400RPM\Multi1400RPMbearing15.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n1=sig_f/(norm(sig_f));
freq_s1=(0:L-1)/T;

subplot(3,1,3);
plot(freq_s1,sig_n1);
```

```
axis ([0 800 0 0.2]);
title('(c) 1400 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```

Script Hasil Plot Domain Frekuensi dan *Envelope* Pada Kecepatan Poros 1600 RPM

```
clear
clc
close

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\BEARING_NORMAL\Normal1600RP
M\Normal1600RPMbearing29.mat')
y1=data_all(:,1);
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1600RPM\M
ulti1600RPMbearing29.mat')
y2=data_all(:,1);

%frekuensi normal
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %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
Y1 = fft(y1,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);

figure
subplot (3,1,1)
plot(f,2*abs(Y1(1:NFFT/2+1)))
axis ([0 1500 0 0.2]);
title('(a) 1600 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

%frekuensi cacat
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y2 = fft(y2,NFFT)/L;
f = sampling_rate/2*linspace(0,1,NFFT/2+1);


subplot (3,1,2)
plot(f,2*abs(Y2(1:NFFT/2+1)))
axis ([0 1500 0 0.2]);
title('(b) 1600 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

%envelope cacat
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1600RPM\M
ulti1600RPMbearing29.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
```

```
sig_f=abs(fft(y(1:L)',L));
sig_n1=sig_f/(norm(sig_f));
freq_s1=(0:L-1)/T;

subplot(3,1,3);
plot(freq_s1,sig_n1);
axis ([0 200 0 0.2]);
title('(c) 1600 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```

Script Perbandingan Grafik Envelope Pada Semua Kecepatan Poros

```
clear
clc
close

sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1000RPM\M
ulti1000RPMbearing30.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n1=sig_f/(norm(sig_f));
freq_s1=(0:L-1)/T;

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1200RPM\M
ulti1200RPMbearing27.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n2=sig_f/(norm(sig_f));
freq_s2=(0:L-1)/T;

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1400RPM\M
ulti1400RPMbearing15.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n1=sig_f/(norm(sig_f));
freq_s1=(0:L-1)/T;

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1600RPM\M
ulti1600RPMbearing29.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n2=sig_f/(norm(sig_f));
freq_s2=(0:L-1)/T;
```

```
%envelope analysis based on Hilbert transform
figure
subplot(4,1,1);
plot(freq_s1,sig_n1);
axis ([0 800 0 0.2]);
title('(a) 1000 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot(4,1,2);
plot(freq_s2,sig_n2);
axis ([0 800 0 0.2]);
title('(b) 1200 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot(4,1,3);
plot(freq_s1,sig_n1);
axis ([0 1000 0 0.2]);
title('(c) 1400 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot(4,1,4);
plot(freq_s2,sig_n2);
axis ([0 1000 0 0.2]);
title('(d) 1600 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```

Script Grafik *Envelope* Cacat Bantalan Yang Tidak Disengaja

```
clear
clc
close

sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1000RPM\M
ulti1000RPMbearing30.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n1=sig_f/(norm(sig_f));
freq_s1=(0:L-1)/T;

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1200RPM\M
ulti1200RPMbearing27.mat')
analy=hilbert(data_all);
```

```
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n2=sig_f/(norm(sig_f));
freq_s2=(0:L-1)/T;
load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1400RPM\M
ulti1400RPMbearing15.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n1=sig_f/(norm(sig_f));
freq_s1=(0:L-1)/T;

load('E:\TUGAS_AKHIR_VIBRASI_2017\ABDI\MULTI_FAULTS\Multi1600RPM\M
ulti1600RPMbearing29.mat')
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n2=sig_f/(norm(sig_f));
freq_s2=(0:L-1)/T;

%envelope analysis based on Hilbert transform
figure
subplot(4,1,1);
plot(freq_s1,sig_n1);
axis ([0 200 0 0.2]);
title('(a) 1000 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot(4,1,2);
plot(freq_s2,sig_n2);
axis ([0 200 0 0.2]);
title('(b) 1200 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot(4,1,3);
plot(freq_s1,sig_n1);
axis ([0 200 0 0.2]);
title('(c) 1400 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')

subplot(4,1,4);
plot(freq_s2,sig_n2);
axis ([0 200 0 0.2]);
title('(d) 1600 rpm')
xlabel('Frequency (Hz)')
ylabel('Amplitudo')
```