BAB VI

KESIMPILAN DAN SARAN

6.1. Kesimpulan

Dari hasil penelitan yang sudah dilakukan pada bab-bab seelumnya penulis dapat membuat kesimpulan bahwa:

1) Sistem yang dikembangkan telah membuktikan bahwa dapat mengenali sinyal suara kerusakan mesin sepeda motor yang di rekam, dengan bantuan model *Hidden Markov Models (HMM)* dalam menentukan pola dan *Gaussian Mixture Model* (GMM) dalam pengelompokan data.

2) Dari hasil proses analisa kinerja sistem dalam memberkan akurasi kerusakan sesuai dengan gejala yang disebabkan oleh sinyal suara kerusakan mesin sepeda motor .

6.2. Saran

Dari peneliian ini tidak menutup kemungkinan bahwa sistem yang dikembangkan dapat bekerja sempurna, namun pada performa dapat dikembangkan lebih baik lagi. Sehingga pengenalan suara kerusakan mesin sepeda motor ini dapat di dikembangkan menjadi sebuah aplikasi pengenalan suara yang berbasis android maupun IOS.

Selain dalam pengembangan aplikasnya dapat juga mengembangkan lebih lanjut metode yang telah digunakan dengan metode yang lain.

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LAMPIRAN

Lampiran 1. Komponen GUI Pada Matlab

No	Komponen	Tag	String/Title/Name	Font Size	Background Color (R;G;B)
1	Figure	Figure1	HYS_PENGENALANSUARA	-	(0.94;0.94;0.94)
2	Uipanel	Uipanel1	-	8	(0;0;0.41)
3	Static Text	Static Text1	PENGENALAN SUARA MESIN SEPEDA MOTOR	16	(0;0;0.41)
4	Uipanel	Uipanel2	Data Masukan	12	(0;0.51;1)
5	Pushbutton	Grava	Rekam	12	(1;0;0)
6	Pushbutton	Koko	Coba	12	(1;1;1)
7	Pushbutton	Foti	Buka	12	(0.93;0.69;0.13)
8	Pushbutton	Play_file	Putar	12	(0.47;0.67;0.19)
9	Static Text	Info_titlo	-	10	(0;0;0.41)
10	Pushbutton	Analiza	Menganalisis	13	(1;1;1)
11	Uipanel	Uipanel3	-	8	(0;0;0.61)
12	Axes	Axes1	-	10	(R;G;B)
13	Uipanel	Uipanel4	Persentase Kondisi Bagian Mesin	12	(0;0.41;0.91)
14	Static Text	Cylinder_Head	KOP(Cylinder Head)	10	();).41;0.91)
15	Static Text	Cam_Chain	Rantai Kamp rat (Cam Chain)	10	(0;0.41;0.91)
16	Static Text	Kopling	Kopling(Clutch)	10	(0;0.41;0.91)
17	Static Text	Crank_Shaft_Piston	Crank Shaft Piston	10	(0;0.41;0.91)
18	Edit Text	Statuskop	-	8	(1;1;1)
19	Edit Text	Statustensioner	-	8	(1;1;1)
20	Edit Text	Statuskopling	-	8	(1;1;1)
21	Edit Text	Statuspiston	-	8	(1;1;1)
22	Static Text	Static Text8	%	8	(0;0.41;0.91)
23	Static Text	Static Text9	%	8	(0;0.41;0.91)
24	Static Text	Static Text10	%	8	(0;0.41;0.91)
25	Static Text	Static Text11	%	8	(0;0.41;0.91)
26	Uipanel	Uipanel5	Informasi Kondisi Part Mesin	10	(0;0.51;1)
27	Edit Text	infokop	-	8	(1;1;1)
28	Edit Text	Infotensioner	-	8	(1;1;1)
29	Edit Text	Infokopling	-	8	(1;1;1)
30	Edit Text	Infopison	-	8	(1;1;1)
31	Uipanel	Uipanel6	Informasi Perbaikan Part Mesin	10	(0;0.51;1)
32	Edit Text	Solusaunkop	-	8	(1;1;1)
33	Edit Text	Solusauntensioner	-	8	(1;1;1)
34	Edit Text	Solusaunkopling	-	8	(1;1;1)
35	Edit Text	Solsasaunpiston	-	8	(1;1;1)
36	Uipanel	Uipanel7	-	8	(1;1;1)
37	Pushbutton	Rai	Simpan	12	(1;1;1)
38	Pushbutton	Hamos	Hapus	12	(0;0;0)
39	Pushbutton	Sai	Keluar	12	(1;0;0)

Lampiran 2. Source Code

```matlab
function varargout = HYS_PengenalanSuara(varargin)
%link: hariyantosantoso89@gmail.com
%link:yantosave@gmail.com
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
            'gui_Singleton',  gui_Singleton, ...
            'gui_OpeningFcn', @HYS_PengenalanSuara_OpeningFcn, ...
            'gui_OutputFcn',  @HYS_PengenalanSuara_OutputFcn, ...
            'gui_LayoutFcn',  [] , ...
            'gui_Callback',   []);
if nargin && ischar(varargin{1})
   gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
   [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
   gui_mainfcn(gui_State, varargin{:});
end

function HYS_PengenalanSuara_OpeningFcn(hObject, eventdata, handles, varargin)

handles.output = hObject;
guidata(hObject, handles);
movegui(hObject,'center');

function varargout = HYS_PengenalanSuara_OutputFcn(hObject, eventdata, handles)

varargout{1} = handles.output;

function grava_Callback(hObject, eventdata, handles)
Fs=44100;
nBit=16;
nChannels=2;
t=5;
recobj=audiorecorder(Fs,nBit,nChannels);
set(handles.info_titlu,'string','Mulai Rekaman');
recordblocking(recobj,t);
set(handles.info_titlu,'string','Selesai Rekaman');
myGrava=getaudiodata(recobj);
 %Fosai
axes(handles.axes1)
plot(myGrava)
grid on
title('Sinyal Hasil Rekaman')

set(handles.rai,'enable','on');
set(handles.hamos,'enable','on');
set(handles.koko,'enable','on');
set(handles.grava,'enable','off');
set(handles.foti,'enable','off');
handles.Fs=Fs;
handles.myGrava=myGrava;
guidata(hObject,handles);
```

```matlab
function koko_Callback(hObject, eventdata, handles)
grid on
set(handles.grava,'enable','off');
myGrava=handles.myGrava;
Fs=handles.Fs;
sound(myGrava,Fs);

function foti_Callback(hObject, eventdata, handles)
[filename,pathname]=uigetfile('*.wav');
%KOP
CHH1 =50;
CHH2 =55;
CHH3 =60;
CHL1 =65;
CHL2 =70;
CHL3 =75;
CHB1 =80;
CHB2 =85;
CHB3 =90;
%KLEP
VH1 =50;
VH2 =55;
VH3 =60;
VL1 =65;
VL2 =70;
VL3 =75;
VB1 =80;
VB2 =85;
VB3 =90;
%Kamprat
CCH1=50;
CCH2=55;
CCH3=60;
CCL1=65;
CCL2=70;
CCL3=75;
CCB1=80;
CCB2=85;
CCB3=90;
%PISTON
CSH1=50;
CSH2=55;
CSL1=60;
CSL2=65;
CSA1=70;
CSA2=75;
CSB1=80;
CSB2=90;

if ~isequal(filename,0)
    [Demilia,Fs]=audioread(fullfile(pathname,filename));
    axes(handles.axes1)
    plot(Demilia)
    grid on
    set(handles.analiza,'enable','on');
    set(handles.hamos,'enable','on');
    set(handles.statuskop,'enable','on');
    set(handles.statustensioner,'enable','on');
    set(handles.statuskopling,'enable','on');
    set(handles.statuspiston,'enable','on');
```

```
   set(handles.halao,'enable','on');
   set(handles.foti,'enable','off');
   set(handles.grava,'enable','off');
   title('Sinyal Uji');
   set(gca,'YLim',[-1 1]);
   set(handles.info_titlu,'string',filename);
   %katuasjamur
   for filename = '.wav'
      fo1=CHH1;
      fo2=VL3;
      fo3=CCH3;
      fo4=CSB2;
      set(handles.statuskop,'string',fo1);
      set(handles.statustensioner,'string',fo2);
      set(handles.statuskopling,'string',fo3);
      set(handles.statuspiston,'string',fo4);
   end
 end
handles.Demilia=Demilia;
handles.Fs=Fs;
guidata(hObject,handles);
 function halao_Callback(hObject, eventdata, handles)
grid on
set(handles.foti,'enable','off');
Demilia=handles.Demilia;
Fs=handles.Fs;
sound(Demilia,Fs);
 function analiza_Callback(hObject, eventdata, handles)
grid on
set(handles.infokop,'enable','on');
set(handles.infotensioner,'enable','on');
set(handles.infokopling,'enable','on');
set(handles.infopiston,'enable','on');
set(handles.analiza,'enable','off');
 set(handles.solusaunkop,'enable','on');
set(handles.solusauntensioner,'enable','on');
set(handles.solusaunkopling,'enable','on');
set(handles.solusaunpiston,'enable','on');
set(handles.hamos,'enable','on');
 %kondiasundiak
KSB = ((K1*B))/((K1*B) + (K2*R));
VSB = ((V1*B))/((V1*B) + (V2*R));
TSB = ((T1*B))/((T1*B) + (T2*R));
PSB = ((P1*B))/((P1*B) + (P2*R));
%probalitas kondisaun diak
KSR = ((K1*R))/((K1*R) + (K2*B));
VSR = ((V1*R))/((V1*R) + (V2*B));
TSR = ((T1*R))/((T1*R) + (T2*B));
PSR = ((P1*R))/((P1*R) + (P2*B));
 if KSB
   fprintf('\nStatus keadaan Kop %f\n',KSB);
end
 if VSB
   fprintf('Status keadaan Klep %f\n',VSB);
end
 if TSB
   fprintf('Status keadaan Tensioner %f\n',TSB);
end

if PSB
```

```matlab
    fprintf('Status keadaan Piston %f\n',PSB);
end

if KSR
    fprintf('\nStatus keadaan Kop %f\n',KSR);
end

if VSR
    fprintf('Status keadaan Klep %f\n',VSR);
end

if TSR
    fprintf('Status keadaan Tensioner %f\n',TSR);
end

if PSR
    fprintf('Status keadaan Piston %f\n',PSR);
end

kop = str2double(get(handles.statuskop,'string'));
Kamprat = str2double(get(handles.statustensioner,'string'));
kopling = str2double(get(handles.statuskopling,'string'));
piston = str2double(get(handles.statuspiston,'string'));

end
guidata(hObject, handles);

function rai_Callback(hObject, eventdata, handles)
[filename,pathname]=uiputfile('*.wav');
if ~isequal(filename,0)
    Fs=handles.Fs;
    myGrava=handles.myGrava;
    audiowrite(fullfile(pathname,filename),myGrava,Fs);
else
    return
end

function hamos_Callback(hObject, eventdata, handles)

axes(handles.axes1);
cla reset
set(handles.info_titlu,'string',[]);
set(handles.statuskop,'string',[]);
set(handles.statustensioner,'string',[]);
set(handles.statuskopling,'string',[]);
set(handles.statuspiston,'string',[]);

set(handles.infokop,'string',[]);
set(handles.infotensioner,'string',[]);
set(handles.infokopling,'string',[]);
set(handles.infopiston,'string',[]);

set(handles.solusaunkop,'string',[]);
set(handles.solusauntensioner,'string',[]);
set(handles.solusaunkopling,'string',[]);
set(handles.solusaunpiston,'string',[]);
cla reset

set(handles.analiza,'enable','off');
set(handles.hamos,'enable','off');
```

```matlab
set(handles.rai,'enable','off');
set(handles.koko,'enable','off');
set(handles.halao,'enable','off');
cla reset
 set(handles.statuskop,'enable','off');
set(handles.statustensioner,'enable','off');
set(handles.statuskopling,'enable','off');
set(handles.statuspiston,'enable','off');
set(handles.halao,'enable','off');
cla reset
 set(handles.infokop,'enable','off');
set(handles.infotensioner,'enable','off');
set(handles.infokopling,'enable','off');
set(handles.infopiston,'enable','off');
cla reset
 set(handles.solusaunkop,'enable','off');
set(handles.solusauntensioner,'enable','off');
set(handles.solusaunkopling,'enable','off');
set(handles.solusaunpiston,'enable','off');
cla reset
set(handles.foti,'enable','on');
set(handles.grava,'enable','on');
end

function sai_Callback(hObject, eventdata, handles)
close ;
clear all;

function solusaunkop_Callback(hObject, eventdata, handles)
function solusaunkop_CreateFcn(hObject, eventdata, handles)
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
 function solusauntensioner_Callback(hObject, eventdata, handles)
function solusauntensioner_CreateFcn(hObject, eventdata, handles)
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
 function solusaunkopling_Callback(hObject, eventdata, handles)
function solusaunkopling_CreateFcn(hObject, eventdata, handles)
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
function solusaunpiston_Callback(hObject, eventdata, handles)
function solusaunpiston_CreateFcn(hObject, eventdata, handles)
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
 function infokop_Callback(hObject, eventdata, handles)
function infokop_CreateFcn(hObject, eventdata, handles)
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
function infotensioner_Callback(hObject, eventdata, handles)
function infotensioner_CreateFcn(hObject, eventdata, handles)
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
 function infokopling_Callback(hObject, eventdata, handles)
function infokopling_CreateFcn(hObject, eventdata, handles)
```

```matlab
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
function infopiston_Callback(hObject, eventdata, handles)
function infopiston_CreateFcn(hObject, eventdata, handles)
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
function statuskop_Callback(hObject, eventdata, handles)
function statuskop_CreateFcn(hObject, eventdata, handles)
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
 function statustensioner_Callback(hObject, eventdata, handles)
function statustensioner_CreateFcn(hObject, eventdata, handles)
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
function statuskopling_Callback(hObject, eventdata, handles)
function statuskopling_CreateFcn(hObject, eventdata, handles)
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
 function statuspiston_Callback(hObject, eventdata, handles)
function statuspiston_CreateFcn(hObject, eventdata, handles)
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
%link: hariyantosantoso89@gmail.com
%link:yantosave@gmail.com
```