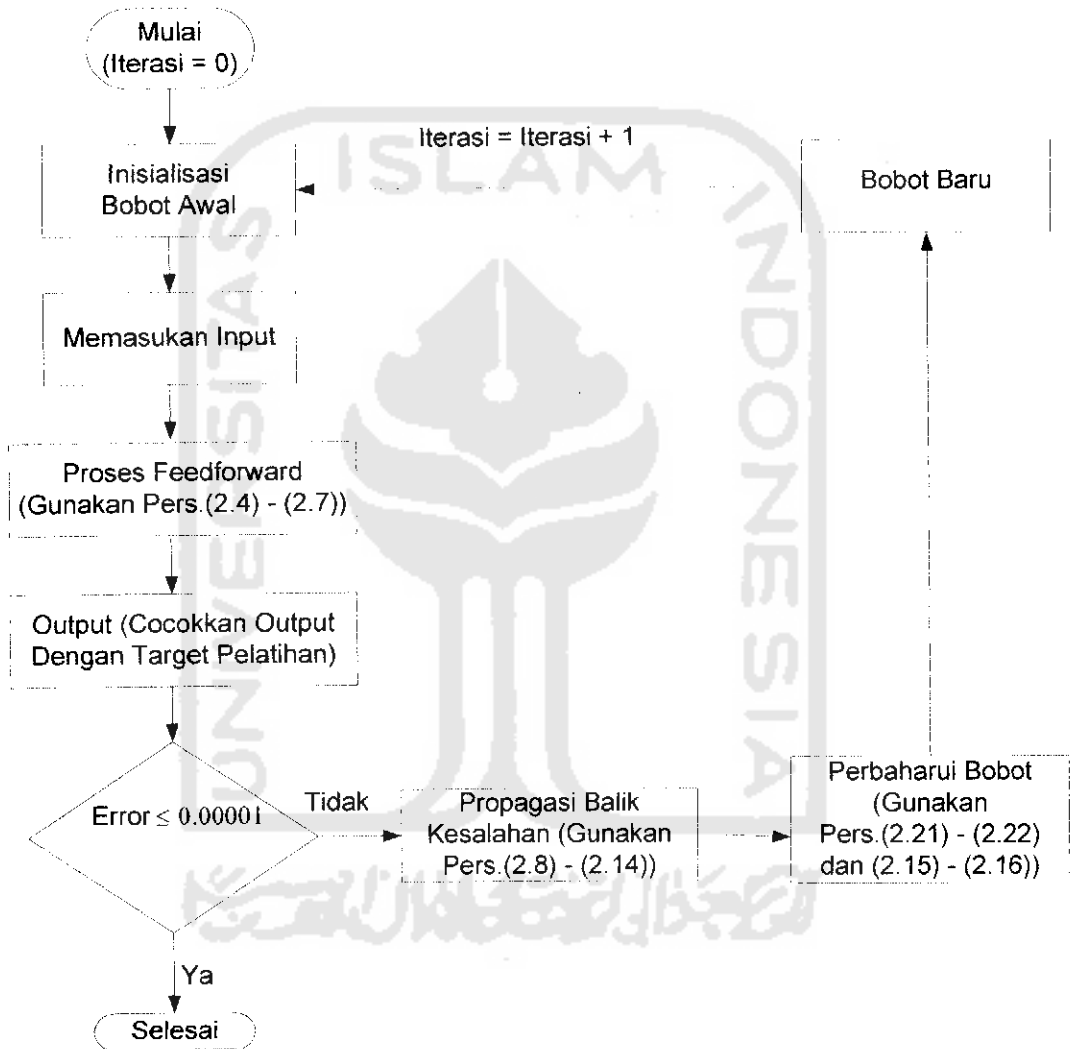


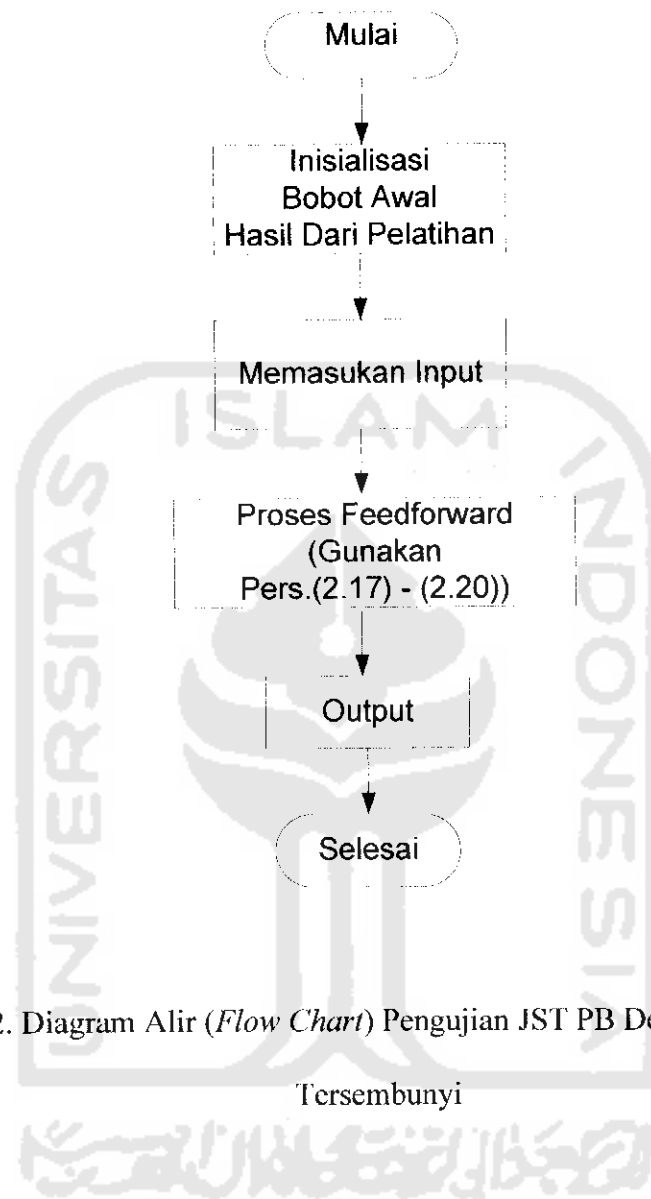


LAMPIRAN



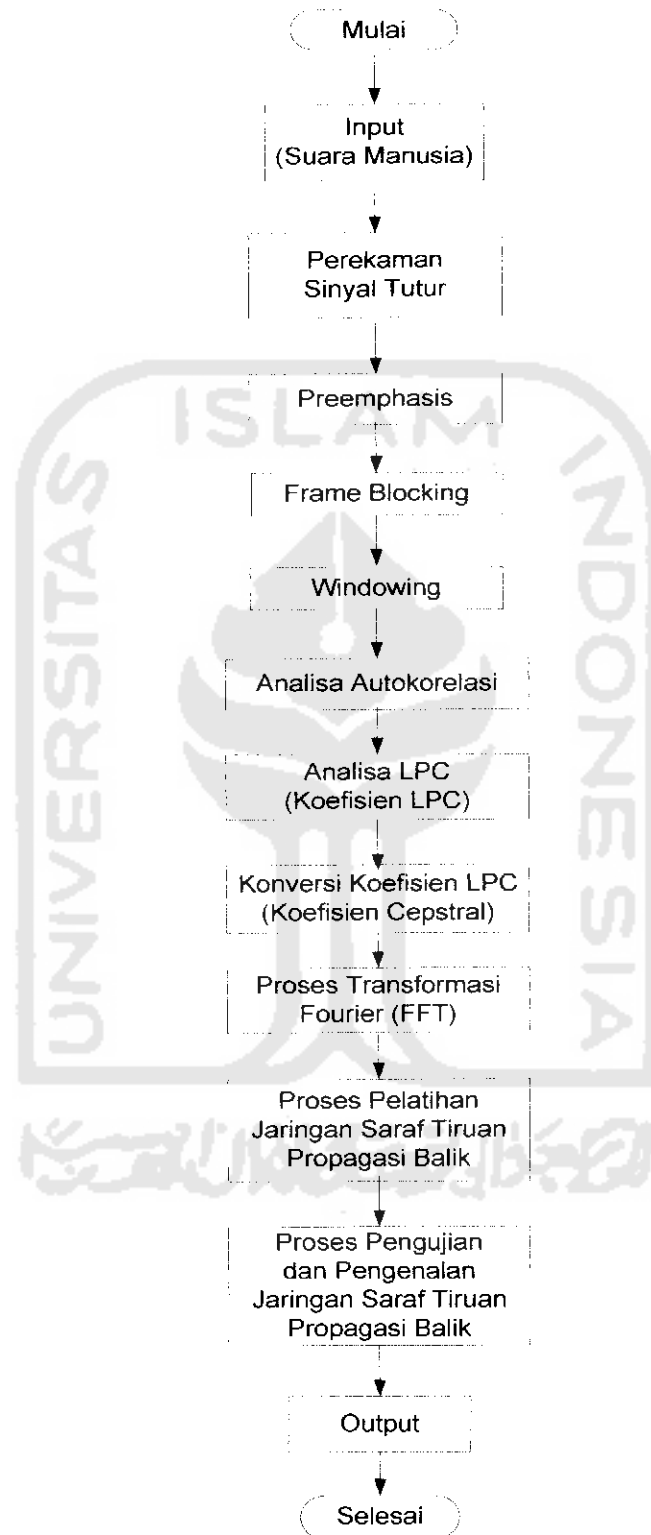
Lampiran 1. Diagram Alir (*Flow Chart*) Pelatihan JST PB Dengan Satu Lapisan

Tersembunyi



Lampiran 2. Diagram Alir (*Flow Chart*) Pengujian JST PB Dengan Satu Lapisan

Tersembunyi



Lampiran 3. Diagram Alir (*Flow Chart*) Proses Pengenalan Suara Manusia

Lampiran 4. Coding Program

1. program_utama_gui.m

```

function fig = programutama_gui()
h0 = figure('color',[0 0 0.85],...
    'FileName','C:\MATLAB6p5\work\gui\programutama_gui\'...
    'HandleVisibility','callback','PaperPosition',[18.0 180.0 576.0 500.0],...
    'Position',[170.25 70 780.75 650.75],'PaperUnits','points'...
    'Tag','programutama_gui','ToolBar','none','UserData',[]);
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
    'Callback','programutama("LOAD PEREKAMAN");'...
    'HorizontalAlignment','center',...
    'ForegroundColor',[0 0 0.85],'ListboxTop',0,...
    'FontSize',14,'FontWeight','bold',...
    'Position',[80 300.25 150.75 30],...
    'String','LOAD PEREKAMAN','Tag','LOAD PEREKAMAN');
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
    'Callback','programutama("LOAD LPC&FFT");'...
    'HorizontalAlignment','center',...
    'ForegroundColor',[0 0 0.85],'ListboxTop',0,...
    'FontSize',15,'FontWeight','bold',...
    'Position',[360 300.25 150.75 30],...
    'String','LOAD LPC dan FFT','Tag','LOAD LPC&FFT');
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
    'Callback','programutama("LOAD JST");','HorizontalAlignment','center',...
    'ForegroundColor',[0 0 0.85],'ListboxTop',0,...
    'FontSize',14,'FontWeight','bold',...
    'Position',[80 200.25 150.75 30],...
    'String','LOAD JS'IPB','Tag','LOAD JST');

```

```

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
    'Callback','programutama("SELESAL");','FontSize',14,...
    'ForegroundColor',[0 0 0.85],'ListboxTop',0,...
    'HorizontalAlignment','center','FontWeight','bold',...
    'Position',[360 200.25 150.75 30],...
    'String','SELESAL','Tag','SELESAL');

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
    'FontSize',24,'FontName','times new roman','FontWeight','bold',...
    'ForegroundColor',[0 0 0],'HorizontalAlignment','center',...
    'ForegroundColor',[1 1 1],...
    'ListboxTop',0,'Position',[55 370 480 100],...
    'String','PROGRAM UTAMA SIMULASI JARINGAN SARAF TIRUAN
    PROPAGASI BALIK UNTUK PENGENALAN SUARA MANUSIA',...
    'FontWeight','bold','Style','text','Tag','StaticText3');

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
    'FontSize',22,'FontName','times new roman',...
    'ForegroundColor',[1 1 1],'HorizontalAlignment','left',...
    'ListboxTop',0,'Position',[15 110.75 130 28],'FontWeight','bold',...
    'String','Keterangan :','Style','text','Tag','StaticText2','Value',1);

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
    'FontSize',16,'FontName','times new roman',...
    'ForegroundColor',[1 1 1],'HorizontalAlignment','left',...
    'ListboxTop',0,'Position',[15 80.75 650 20],'FontWeight','bold',...
    'String','- Untuk Perckaman Suara, Tekan "LOAD PEREKAMAN"',...
    'Style','text','Tag','StaticText2','Value',1);

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
    'FontSize',15,'FontName','times new roman',...
    'ForegroundColor',[1 1 1],'HorizontalAlignment','left',...
    'ListboxTop',0,'Position',[15 50.75 550 20],'FontWeight','bold',...
    'String','- Untuk Pemrosesan Suara Dengan LPC dan FFT, Tekan "LOAD
    LPC dan FFT"',...

```

```

'Style','text','Tag','StaticText2','Value',1);
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
'FontSize',15,'FontName','times new roman',...
'ForegroundColor',[1 1 1],'HorizontalAlignment','left',...
'ListboxTop',0,'Position',[15 20.75 580 20],'FontWeight','bold',...
'String','- Untuk Pelatihan,Pengujian dan Pengenalan Suara, Tekan "LOAD
JSTPB"',...
'Style','text','Tag','StaticText2','Value',1);
if nargin > 0, fig = h0; end

```

2. programutama.m

```

function programutama (mulai);
switch mulai
case 'LOAD PEREKAMAN'
    rekam_gui;
case 'LOAD JST'
    propagasibalik_gui;
case 'LOAD LPC&FFT'
    lpc_gui;
case 'SELESAI'
    close;
end;

```

3. rekam_gui.m

```

function fig = rekam_gui()
h0 = figure('color',[0 0 0.85],...
'FileName','C:\MATLAB6p5\work\gui\rekam_gui',...
'HandleVisibility','callback','PaperPosition',[18.0 180.0 576.0 500.0],...
'Position',[170.25 70 780.75 650.75],'PaperUnits','points',...
'Tag','rekam_gui','ToolBar','none','UserData',[]);

```

```

h1 = axes('parent',h0,'Units','pixels','CameraUpVector',[0 1 0],...
    'CameraUpVectorMode','manual','Color',[0.502 1 1],...
    'AmbientLightColor',[0 0 1],...
    'Position',[50 220 450 220],'Tag','grafik','FontWeight','bold',...
    'XColor',[1 1 1],'YColor',[1 1 1]);
h2 = text('parent',h1,'color',[1 1 1],'HandleVisibility','off',...
    'HorizontalAlignment','center','position',[0.498 -0.157],'FontSize',14,...
    'Tag','Axes1Text4','String','Waktu(defik)','VerticalAlignment','cap');
set(get(h2,'parent'),'Xlabel',h2);
h2 = text('parent',h1,'color',[1 1 1],'HandleVisibility','off',...
    'HorizontalAlignment','center','position',[-0.0573 0.4902],...
    'FontSize',14,'rotation',90,'Tag','Axes1Text3',...
    'String','Amplitudo(volt)','VerticalAlignment','baseline');
set(get(h2,'parent'),'Ylabel',h2);
h2 = text('parent',h1,'color',[0 0 0],'HandleVisibility','off',...
    'HorizontalAlignment','center','position',[0.498 1.046],...
    'Tag','Axes1Text1','VerticalAlignment','bottom');
set(get(h2,'parent'),'Title',h2);
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
    'FontSize',14,'ForegroundColor',[1 1 1],'HorizontalAlignment','right',...
    'ListBoxTop',0,'Position',[330 70.75 30 20],'FontWeight','bold',...
    'String','1','Style','text','Tag','cacah1','UserData',1);
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
    'FontSize',14,'ForegroundColor',[1 1 1],'HorizontalAlignment','center',...
    'ListBoxTop',0,'Position',[45 40.75 450 20],'FontWeight','bold',...
    'String','Tekan "BUNYI" untuk membunyikan suara yang telah direkam ',...
    'Style','text','Tag','StaticText1');
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
    'FontSize',14,'ForegroundColor',[1 1 1],'HorizontalAlignment','left',...
    'ListBoxTop',0,'Position',[50 70.75 250 20],'FontWeight','bold',...
    'String','Tekan "OK" untuk merekam data ke - ',...

```



```

'Style','text','Tag','StaticText1');
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
'Callback','rekam_suara("OK");','FontSize',18,...
'ForegroundColor',[0 0 0.85],'ListboxTop',0,'FontWeight','bold',...
'Position',[430 300.25 130.75 30],'String','OK','Tag','OK');
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
'FontSize',14,'ForegroundColor',[1 1 1],'HorizontalAlignment','left',...
'ListboxTop',0,'Position',[50 340.75 150.75 17.25],...
'String','Plot Suara','Style','text','Tag','StaticText2','Value',1);
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
'FontSize',14,'ForegroundColor',[1 1 1],'HorizontalAlignment','left',...
'ListboxTop',0,'Position',[50 10.75 450 20],'FontWeight','bold',...
'String','Tekan "SELESAI" Untuk Mengakhiri rekaman data','Style','text',...
'Tag','StaticText2','Value',1);
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
'FontSize',14,'ForegroundColor',[1 1 1],'HorizontalAlignment','left',...
'ListboxTop',0,'Position',[50 370 500 40],'FontWeight','bold',...
'String','KOSAKATA YANG AKAN DIREKAM : MAMA - PAPA - DIDI -
BUDI - DODI - BUKA - TUTUP - MULAI - MAJU - BELOK',...
'Style','text','Tag','StaticText2','Value',1);
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
'FontSize',20,'FontName','times new roman',...
'ForegroundColor',[1 1 1],'HorizontalAlignment','left',...
'ListboxTop',0,'Position',[50 100.75 130 28],'FontWeight','bold',...
'String','Keterangan :','Style','text','Tag','StaticText2','Value',1);
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
'Callback','rekam_suara("SELESAI");','FontWeight','bold',...
'ForegroundColor',[0 0 0.85],'ListboxTop',0,'FontSize',18,...
'Position',[430 150.25 130.75 30],'String','SELESAI','Tag','SELESAI');
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
'Callback','rekam_suara("BUNYI");','FontWeight','bold',...

```

```

'ForegroundColor',[0 0 0.85],'ListBoxTop',0,'FontSize',18,...
'Position',[430 230.25 130.75 30],'String','BUNYI','Tag','BUNYI');
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
'FontSize',24,'ForegroundColor',[1 1 1],'HorizontalAlignment','center',...
'ListBoxTop',0,'Position',[55 430 480 50],'FontWeight','bold',...
'String','PROSES PEREKAMAN SUARA ','Style','text',...
'FontName','times new roman','Tag','StaticText3','Value',1);
if nargout > 0, fig = h0; end
data.figH = h0;
data.cacah1H = findobj(h0,'Tag','cacah1');
data.grafikH = findobj(h0,'Tag','grafik');
data.bunyiH = findobj(h0,'Tag','BUNYI');
data.sclesaiH = findobj(h0,'Tag','SELESAI');
data.sinyal = [];
set(h0,'UserData',data);

```

4. rekam_suara.m

```

function rekam_suara (mulai);
data = get(findobj(0,'Tag','rekam_gui'),'UserData');
switch mulai
case 'OK'
    sinyal = wavrecord(4000,8000,'double');
    sinyal = sinyal-mean(sinyal);
    sinyal = sinyal/max(abs(sinyal));
    cla;
    line('parent',data.grafikH,'XData',[1:4000],'YData',sinyal);
    cacah1 = get(data.cacah1H,'UserData');
    cacah1 = cacah1 + 1;
    set(data.cacah1H,'string',cacah1,'UserData',cacah1);
    data.sinyal = [data.sinyal;sinyal];
    set(data.figH,'UserData',data);

```

```

    set(data.bunyiH,'enable','on');
case 'BUNYI'
    sinyal = data.sinyal;
    wavplay(sinyal,8000);
case 'SELESAI'
    sinyal = data.sinyal;
    [path] =( 'E:\My Documents\Noer_TA\Suara\');
    [na_file] = uiputfile('* .mat','Hasil Perekaman Suara');
    file_data = [path,na_file];
    eval(['save "' file_data "' sinyal']);
    uiresume;
    cla;
    close(data.figH);
end

5. lpc_gui.m

function fig = lpc_gui()
h0 = figure('color',[0 0 0.85],...
    'FileName','C:\MATLAB6p5\work\gui\lpc_gui',...
    'HandleVisibility','callback','PaperPosition',[18.0 180.0 576.0 500.0],...
    'Position',[170.25 70 780.75 650.75],'PaperUnits','points',...
    'Tag','lpc_gui','ToolBar','none','UserData',{});
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
    'Callback','proses_lpc("PROSES");','FontSize',18,...
    'ForegroundColor',[0 0 0.85],'ListboxTop',0,'FontWeight','bold',...
    'Position',[60 80.25 130.75 30],'String','PROSES','Tag','PROSES');
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
    'Callback','proses_lpc("SELESAI");','enable','inactive',...
    'FontWeight','bold','ForegroundColor',[0 0 0.85],...
    'ListboxTop',0,'FontSize',18,'FontWeight','bold',...
    'Position',[390 80.25 130.75 30],'String','SELESAI','Tag','SELESAI');

```

```

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
'FontSize',24,'FontName','times new roman','FontWeight','bold',...
'ForegroundColor',[1 1 1],'HorizontalAlignment','center',...
'ListBoxTop',0,'Position',[50 400 500 50],...
'String','PEMROSESAN SINYAL SUARA DENGAN LPC DAN
FFT','Style','text','Tag','StaticText3');

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
'FontSize',20,'FontName','MS Sans Serif','FontWeight','bold',...
'ForegroundColor',[0 0 0.85],'HorizontalAlignment','center',...
'ListBoxTop',0,'Position',[60.75 300.75 80 30],...
'String','LPC :','Style','text','Tag','StaticText3');

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
'FontSize',20,'FontName','MS Sans Serif',...
'ForegroundColor',[0 0 0.85],'HorizontalAlignment','center',...
'ListBoxTop',0,'Position',[60.75 220.75 80 30],...
'String','FFT :','Style','text','Tag','StaticText3');

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
'FontSize',20,'FontName','MS Sans Serif','FontWeight','bold',...
'ForegroundColor',[0 0 0.85],'HorizontalAlignment','center',...
'ListBoxTop',0,'Position',[180 300.75 80 30],...
'String','p = 10','Style','text','Tag','StaticText3');

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
'FontSize',20,'FontName','MS Sans Serif','FontWeight','bold',...
'ForegroundColor',[0 0 0.85],'HorizontalAlignment','center',...
'ListBoxTop',0,'Position',[310 300.75 80 30],...
'String','N = 240','Style','text','Tag','StaticText3');

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
'FontSize',20,'FontName','MS Sans Serif','FontWeight','bold',...
'ForegroundColor',[0 0 0.85],'HorizontalAlignment','center',...
'ListBoxTop',0,'Position',[440 300.75 80 30],...
'String','M = 80','Style','text','Tag','StaticText3');

```

```

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
'FontSize',20,'FontName','MS Sans Serif','FontWeight','bold',...
'ForegroundColor',[0 0 0.85],'HorizontalAlignment','center',...
'ListBoxTop',0,'Position',[180 220.75 100 30],...
'String','512 Point','Style','text','Tag','StaticText3');
if nargin > 0, fig = h0; end
data.figH = h0;
data.prosesH = findobj(h0,'Tag','PROSES');
data.selesaiH = findobj(h0,'Tag','SELESAI');
set(h0,'UserData',data);

```

6. proses_lpc.m

```

function proses_lpc (mulai);
data = get(findobj(0,'Tag','lpc_gui'),'UserData');
figH = data.figH;
selesaiH = data.selesaiH;
switch mulai
case 'PROSES'
flag =0;
eval(['file_name,path_name] = uigetfile("*.mat","Membaca File
Perekaman");')
if flag
iduiSTAT ('The file does not exist')
return
end
if isstr(file_name)
err =0;
eval(['load(" path_name file_name ","-mat")'], 'err=1;')
if err
errorDlg(['file',path_name file_name,'tidak bisa dibaca.']);
end

```

```

end
output_lpc = proseslpc_fft(sinyal);
data.output_lpc = output_lpc;
set(figH,'UserData',data);
set(selesaiH,'enable','on');
case 'SELESAI'
output_lpc = data.output_lpc;
[path] = ('E:\My Documents\Noer_TA\Hasil_lpc_fft\');
[na_file] = uiputfile('* .mat','Hasil Proses LPC & FFT');
file_data = [path,na_file];
eval(['save "' file_data '" output_lpc']);
uiresume;
close(figH);
end;

```

7. proseslpc_fft.m

```

function hasil_lpc_fft = proseslpc_fft(sinyal)
b = [1 -0.95];
a = 1;
p = 10;
M = 80;
N = 240;
sf = filter(b,a,sinyal); % preemphasis
L = round(length(sf)/M);%mendapatkan jumlah frame
sf = vertcat(sf,zeros(M*(L-1)+N-length(sf),1));%proses frame blocking
for l = 1:L
for n = 1:N
xl(n,l) = sf(M*(l-1)+n);%frame blocking
end;
end;
w = hamming(N);%windowing

```

```

for i = 1:L
    xlt(:,i) = xl(:,i).*w;
end;
ko = lpc(xlt,p);%autokorelasi
A = real(ko(:,2:p+1));%analisis LPC
for m = 1:p
    if m == 1
        c(:,1) = -A(:,1);
    else
        su1 = 0;
        for k = 1:m-1
            su = (1 - k/m).*A(:,k).*c(:,m-k);%koef.cepstral
            su1 = su1+su;
        end;
        c(:,m) = -A(:,m) - su1;%koef.cepstral
    end;
end;
kata1 = c(1:50,:);
kata2 = c(51:100,:);
kata3 = c(101:150,:);
kata4 = c(151:200,:);
kata5 = c(201:250,:);
kata6 = c(251:300,:);
kata7 = c(301:350,:);
kata8 = c(351:400,:);
kata9 = c(401:450,:);
kata10 = c(451:500,:);
kata1 = vertcat(kata1(:,1),kata1(:,2),kata1(:,3),kata1(:,4),kata1(:,5),...
    kata1(:,6),kata1(:,7),kata1(:,8),kata1(:,9),kata1(:,10));
kata2 = vertcat(kata2(:,1),kata2(:,2),kata2(:,3),kata2(:,4),kata2(:,5),...
    kata2(:,6),kata2(:,7),kata2(:,8),kata2(:,9),kata2(:,10));

```

```

kata3 = vertcat(kata3(:,1),kata3(:,2),kata3(:,3),kata3(:,4),...
    kata3(:,5),kata3(:,6),kata3(:,7),kata3(:,8),kata3(:,9),kata3(:,10));
kata4= vertcat(kata4(:,1),kata4(:,2),kata4(:,3),kata4(:,4),...
    kata4(:,5),kata4(:,6),kata4(:,7),kata4(:,8),kata4(:,9),kata4(:,10));
kata5= vertcat(kata5(:,1),kata5(:,2),kata5(:,3),kata5(:,4),...
    kata5(:,5),kata5(:,6),kata5(:,7),kata5(:,8),kata5(:,9),kata5(:,10));
kata6= vertcat(kata6(:,1),kata6(:,2),kata6(:,3),kata6(:,4),...
    kata6(:,5),kata6(:,6),kata6(:,7),kata6(:,8),kata6(:,9),kata6(:,10));
kata7= vertcat(kata7(:,1),kata7(:,2),kata7(:,3),kata7(:,4),...
    kata7(:,5),kata7(:,6),kata7(:,7),kata7(:,8),kata7(:,9),kata7(:,10));
kata8= vertcat(kata8(:,1),kata8(:,2),kata8(:,3),kata8(:,4),...
    kata8(:,5),kata8(:,6),kata8(:,7),kata8(:,8),kata8(:,9),kata8(:,10));
kata9 = vertcat(kata9(:,1),kata9(:,2),kata9(:,3),kata9(:,4),...
    kata9(:,5),kata9(:,6),kata9(:,7),kata9(:,8),kata9(:,9),kata9(:,10));
kata10= vertcat(kata10(:,1),kata10(:,2),kata10(:,3),kata10(:,4),...
    kata10(:,5),kata10(:,6),kata10(:,7),kata10(:,8),kata10(:,9),kata10(:,10));
hasil_lpc = horzcat(kata1,kata2,kata3,kata4,kata5,kata6,kata7,kata8,kata9,kata10);
[m n] =size(hasil_lpc);
for i=1:n
    hasil_fft1(:,i) = real(fft(hasil_lpc(:,i),512));
end;
for i=1:n
    hasil_fft = hasil_fft1(1:256,:);
end;
hasil_lpc_fft = hasil_fft;

```


8. proseslpc_fft1kata.m

```

function hasil_lpc = proseslpc_fft1kata(sinyal)
b = [1 -0.95];
a = 1;
p = 10;
M = 80;
N = 240;
sn = filter(b,a,sinyal); % preemphasis
L = round(length(sn)/M); %mendapatkan jumlah frame
sn = vertcat(sn,zeros(M*(L-1)+N-length(sn),1)); %proses frame blocking
for l = 1:L
    for n = 1:N
        xl(n,l) = sn(M*(l-1)+n); %frame blocking
    end;
end;
w = hamming(N); %windowing
for i = 1:L
    xlt(:,i) = xl(:,i).*w;
end;
kf = lpc(xlt,p); %autokorelasi
A = real(kf(:,2:p+1)); %analisis LPC
for m = 1:p
    if m == 1
        c(:,1) = -A(:,1); %koef.cepstral
    else
        sum1 = 0;
        for k = 1:m-1
            sum = (1 - k/m).*A(:,k).*c(:,m-k); %koef.cepstral
            sum1 = sum1+sum;
        end;
        c(:,m) = -A(:,m) - sum1; %koef.cepstral
    end;
end;

```

```

end;
end;
kata1 = [c];
kata1 = vertcat(kata1(:,1),kata1(:,2),kata1(:,3),kata1(:,4),...
    kata1(:,5),kata1(:,6),kata1(:,7),kata1(:,8),kata1(:,9),kata1(:,10));
kata1 = real(fft(kata1,512));%Proses Transformasi Fourier
hasil_fft1 = kata1(1:256,:);
hasil_lpc = hasil_fft1;

```

9. propagasibalik_gui.m

```

function fig= propagasibalik_gui()
h0 = figure('color',[0 0 0.85],...
    'FileName','C:\MATLAB6p5\work\gui\propagasibalik_gui',...
    'HandleVisibility','callback','PaperPosition',[18.0 180.0 576.0 500.0],...
    'Position',[170.25 70 780.75 650.75],'PaperUnits','points',...
    'Tag','propagasibalik_gui','ToolBar','none','UserData',[]);
h1 = axes('parent',h0,'Units','pixels','CameraUpVector',[0 1 0],...
    'CameraUpVectorMode','manual','Color',[0.502 1 1],'FontWeight','bold',...
    'Position',[50 180 420 220],'Tag','grafik',...
    'XColor',[1 1 1],'YColor',[1 1 1]);
h2 = text('parent',h1,'color',[0 0 0],'HandleVisibility','off',...
    'HorizontalAlignment','center','position',[0.498 -0.157],...
    'FontWeight','bold','Tag','Axes1Text4',...
    'String','Jumlah Cuplikan(cuplikan)','VerticalAlignment','cap');
set(get(h2,'parent'),'Xlabel',h2);
h2 = text('parent',h1,'color',[0 0 0],'HandleVisibility','off',...
    'HorizontalAlignment','center',...
    'position',[-0.0573 0.4902],'FontWeight','bold',...
    'rotation',90,'Tag','Axes1Text3','String','Amplitudo(volt)',...
    'VerticalAlignment','baseline');
set(get(h2,'parent'),'Ylabel',h2);

```

```

h2 = text('parent',h1,'color',[0 0 0],'HandleVisibility','off',...
'HorizontalAlignment','center','position',[0.498 1.046],...
'FontWeight','bold',...
'Tag','Axes1Text1','VerticalAlignment','bottom');
set(get(h2,'parent'),'Title',h2);

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
'Callback','propagasibalik_jst("LATIH");','HorizontalAlignment','center',...
'ForegroundColor',[0 0 0.85],'ListboxTop',0,...
'FontSize',18,'FontWeight','bold',...
'Position',[420.75 270.25 150.75 25.75],'String','LATIH','Tag','LATIH');

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
'Callback','propagasibalik_jst("UJI");','HorizontalAlignment','center',...
'ForegroundColor',[0 0 0.85],'ListboxTop',0,...
'FontSize',18,'FontWeight','bold',...
'Position',[420.75 180.25 150.75 25.75],'String','UJI','Tag','UJI');

h1 = uicontrol('parent',h0,'Units','points',...
'BackgroundColor',[0.502 1 1],'enable','on',...
'Callback','propagasibalik_jst("PENGENALAN KATA");',...
'HorizontalAlignment','center','ForegroundColor',[0 0 0.85],
'ListboxTop',0,'FontSize',18,'FontWeight','bold',...
'Position',[420.75 80.25 150.75 25.75],...
'String','PENGENALAN','Tag','PENGENALAN KATA');

h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
'FontSize',14,'FontName','MS Sans Serif','FontWeight','bold',...
'ForegroundColor',[1 1 1],'HorizontalAlignment','center',...
'ListBoxTop',0,'Position',[70.75 50.25 200.75 23.75],...
'String','HASIL PENGENALAN ','Style','text','Tag','StaticText1');

h1 = uicontrol('parent',h0,'Units','points',...
'BackgroundColor',[1 1 1],'FontSize',14,'FontWeight','bold',...
'ForegroundColor',[0 0 0.85],'ListboxTop',0,...
'Position',[20.75 20.25 300.75 35],...

```

```

'Style','edit','HorizontalAlignment','center','String','xxxxx','Tag','xxxxx');
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0.502 1 1],...
'Callback','propagasibalik_jst("SELESAI");',...
'enable','inactive','FontSize',18,...
'ForegroundColor',[0 0 0.85],'ListboxTop',0,...
'HorizontalAlignment','center','FontWeight','bold',...
'Position',[420.75 20.25 150.75 25.75],...
'String','SELESAI','Tag','SELESAI');
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
'FontSize',24,'FontName','times new roman',...
'ForegroundColor',[1 1 1],'HorizontalAlignment','center',...
'ListBoxTop',0,'Position',[30 400 530 80],...
'String','PROSES PELATIHAN DAN PENGUJIAN SERTA
PENGENALAN SUARA DENGAN JARINGAN SARAF TIRUAN
PROPAGASI BALIK',...
'FontWeight','bold','Style','text','Tag','StaticText3');
h1 = uicontrol('parent',h0,'Units','points','BackgroundColor',[0 0 0.85],...
'FontSize',14,'ForegroundColor',[1 1 1],'HorizontalAlignment','left',...
'ListBoxTop',0,'Position',[36.75 320.75 500 35],'FontWeight','bold',...
'String','KATA YANG AKAN DIKENALI : MAMA - PAPA - DIDI -
BUDI - DODI - BUKA - TUTUP - MULAI - MAJU - BELOK',...
'Style','text','Tag','StaticText2','Value',1);
if nargin > 0, fig = h0; end
data.figH = h0;
data.latihH = findobj(h0,'Tag','LATIH');
data.ujiH = findobj(h0,'Tag','UJI');
data.grafikH = findobj(h0,'Tag','grafik');
data.pengenalankataH = findobj(h0,'Tag','PENGENALAN KATA');
data.xxxxxH = findobj(h0,'Tag','xxxxx');
data.selesaiH = findobj(h0,'Tag','SELESAI');
set(h0,'UserData',data);

```

10. propagasibalik_jst.m

```

function propagasibalik_jst (mulai);
data      = get(findobj(0,'Tag','propagasibalik_gui'),'UserData');
figH      = data.figH;
sclesaiH  = data.sclesaiH;
xxxxxH    = data.xxxxxH;
target_jst = {0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 1 1,...
              0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 1 1,...
              0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 1 1,...
              0 0 0 0 0 0 0 0 1 1;
              0 0 0 0 1 1 1 1 0 0 0 0 0 0 1 1 1 1 0 0 0 0 0 0 1 1 1 1 0 0,...
              0 0 0 0 1 1 1 1 0 0 0 0 0 0 1 1 1 1 0 0 0 0 0 0 1 1 1 1 0 0,...
              0 0 0 0 1 1 1 1 0 0 0 0 0 0 1 1 1 1 0 0 0 0 0 0 1 1 1 1 0 0,...
              0 0 0 0 1 1 1 1 0 0;
              0 0 1 1 0 0 1 1 0 0 0 0 0 1 1 0 0 1 1 0 0 0 0 0 1 1 0 0 1 1 0 0,...
              0 0 1 1 0 0 1 1 0 0 0 0 0 1 1 0 0 1 1 0 0 0 0 0 1 1 0 0 1 1 0 0,...
              0 0 1 1 0 0 1 1 0 0 0 0 0 1 1 0 0 1 1 0 0 0 0 0 1 1 0 0 1 1 0 0,...
              0 0 1 1 0 0 1 1 0 0;
              0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1,...
              0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1,...
              0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1,...
              0 1 0 1 0 1 0 1 0 1};

load('E:\My Documents\Noer_TA\Hasil_lpc_ff\lpc1.mat')
input_net1 = output_lpc;
load('E:\My Documents\Noer_TA\Hasil_lpc_ff\lpc2.mat')
input_net2 = output_lpc;
load('E:\My Documents\Noer_TA\Hasil_lpc_ff\lpc3.mat')
input_net3 = output_lpc;
load('E:\My Documents\Noer_TA\Hasil_lpc_ff\lpc4.mat')
input_net4 = output_lpc;
load('E:\My Documents\Noer_TA\Hasil_lpc_ff\lpc5.mat')

```

```

input_net5 = output_lpc;
load('E:\My Documents\Noer_TA\Hasil_lpc_ff\lpc6.mat')
input_net6 = output_lpc;
load('E:\My Documents\Noer_TA\Hasil_lpc_ff\lpc7.mat')
input_net7 = output_lpc;
load('E:\My Documents\Noer_TA\Hasil_lpc_ff\lpc8.mat')
input_net8 = output_lpc;
load('E:\My Documents\Noer_TA\Hasil_lpc_ff\lpc9.mat')
input_net9 = output_lpc;
load('E:\My Documents\Noer_TA\Hasil_lpc_ff\lpc10.mat')
input_net10 = output_lpc;
in_jst= horzcat(input_net1,input_net2,input_net3,input_net4,input_net5,...
    input_net6,input_net7,input_net8,input_net9,input_net10);
switch mulai
case 'LATIH'
    net = newff(minmax(in_jst),[180 100 80 4],{'logsig' 'logsig' 'logsig'
        'logsig'},'traingdx');
    net.trainParam.epochs = 10000;
    net.trainParam.goal = 1e-4;
    net.trainParam.lr = 0.5;
    net.trainParam.mc = 0.8;
    net.trainParam.show = 50;
    bobot_awal_input = net.IW{1,1};
    bobot_awal_bias_input = net.b{1,1};
    bobot_awal_bias_lapisan1 = net.b{2,1};
    bobot_awal_bias_lapisan2 = net.b{3,1};
    bobot_awal_bias_lapisan2 = net.b{4,1};
    bobot_awal_lapisan1 = net.LW{2,1};
    bobot_awal_lapisan2 = net.LW{3,2};
    bobot_awal_lapisan2 = net.LW{4,3};
    nct = train(net,in_jst,target_jst);

```

```

bobot_akhir_input = net.IW{1,1};
bobot_akhir_bias_input = net.b{1,1};
bobot_akhir_lapisan1 = net.LW{2,1};
bobot_akhir_lapisan2 = net.LW{3,1};
bobot_akhir_lapisan3 = net.LW{4,1};
bobot_akhir_bias_lapisan1 = net.b{2,1};
bobot_akhir_bias_lapisan2 = net.b{3,1};
bobot_akhir_bias_lapisan3 = net.b{4,1};
data.net = net;
set(figH,'UserData',data);
set(selesaiH,'enable','on')
case 'UJI'
load('E:\My Documents\Noer_TA\Hasil_latih\net_jst.mat')
data.net = net;
out_jst = sim(data.net,in_jst);
output_jst = proses_out_jst(out_jst)
set(selesaiH,'enable','on')
case 'PENGENALAN KATA'
sinyal = wavrecord(4000,8000,'double');
sinyal = sinyal-mean(sinyal);
sinyal = sinyal/max(abs(sinyal));
cla;
line('parent',data.grafikH,'XData',[1:4000],'YData',sinyal);
input_jst = proseslpc_fft1kata(sinyal);
load('E:\My Documents\Noer_TA\Hasil_latih\net_jst.mat')
data.net = net;
out_jst_kata = sim(data.net,input_jst);
kata = proses_out_jst(out_jst_kata);
if kata == [0; 0; 0; 0]
set(xxxxxH,'string','MAMA')
elseif kata == [0; 0; 0; 1]

```

```

        set(xxxxxH,'string','PAPA')
elseif kata == [0; 0; 1; 0]
        set(xxxxxH,'string','DIDI')
elseif kata == [0; 0; 1; 1]
        set(xxxxxH,'string','BUDI')
elseif kata == [0; 1; 0; 0]
        set(xxxxxH,'string','DODI')
elseif kata == [0; 1; 0; 1]
        set(xxxxxH,'string','BUKA')
elseif kata == [0; 1; 1; 0]
        set(xxxxxH,'string','TUTUP')
elseif kata == [0; 1; 1; 1]
        set(xxxxxH,'string','MULAI')
elseif kata == [1; 0; 0; 0]
        set(xxxxxH,'string','MAJU')
elseif kata == [1; 0; 0; 1]
        set(xxxxxH,'string','BELOK')
else
        set(xxxxxH,'string','Maaf Suara Anda Tidak Dikenali')
end;

case 'SELESAI'
nct = data.net;
[path] = ('E:\My Documents\Noer_TA\Hasil_latih\');
[na_file] = uiputfile('*.mat','Hasil Pelatihan Jaringan');
file_data = [path,na_file];
eval(['save "' file_data "' net']);
close(figH)
end;

```


11. proses_out_jst.m

```
function hasil_jst = proses_out_jst(out_jst)
```

```
[m n] = size(out_jst);
```

```
for p=1:m
```

```
    for q=1:n
```

```
        if out_jst(p,q) >= 0.5
```

```
            hasil_jst(p,q) = 1;
```

```
        else
```

```
            hasil_jst(p,q) = 0;
```

```
        end
```

```
    end
```

```
end
```

