



Faculty of Electrical Engineering

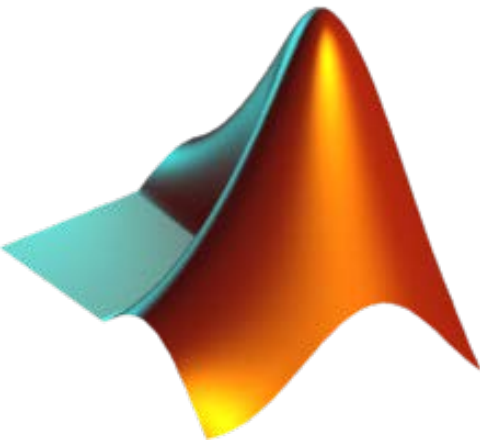
Islamic Azad University of Najafabad



Computer Programming

Part 8: Using Signals

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محاسبه سیگنال به نویز

```
t = 0:0.01:10;
[m,n] = size (t);
noise = randn (m,n);
k=1;
for a = 0.01:0.1:1000
    y = a*sin(t);
    y_noisy = y+noise;
    E_s = sum(y.^2);
    E_n = sum (noise.^2);
    A(k) = a;
    snr(k)= E_s/E_n;
    E_s_db = 10*log10(E_s);
    E_n_db = 10*log10(E_n);
    snr_db(k)= E_s_db/E_n_db;
    if snr_db(k) >= 2.5
        A(k)
        break
    end
    k = k+1;
end
plot(A,snr_db)
```



محاسبه سیگنال به نویز بر حسب دی بی

```
t = 0:0.01:10;
[m,n] = size (t);
noise = randn (m,n);
k=1;
snr_db_temp=0;
a = 0.01;
while snr_db_temp < 2
    a = a+0.1;
    if (a>1000)
        break
    end
    y = a*sin(t);
    y_noisy = y+noise;
    E_s = sum(y.^2);
    E_n = sum (noise.^2);
    A(k) = a;
    snr(k)= E_s/E_n;
    E_s_db = 10*log10(E_s);
    E_n_db = 10*log10(E_n);
    snr_db(k)= E_s_db/E_n_db;
    snr_db_temp=snr_db(k);
    k = k+1;
end
a
plot(A,snr_db)
```



حذف سکوت سیگنال

```
t = 0:0.1:100;
y1 = sin(t);
[m,n]= size (y1);
y = zeros (1,6*n);
for i= 1:6*n
    if i <=n
        y(i)=y1(i);
    elseif (i>n) & (i <= 2*n)
        y(i) = 0;
    elseif (i>2*n) & (i <=3*n)
        y(i) = 2*y1(i-2*n);
    elseif (i>3*n) & (i <=4*n)
        y(i) = 0;
    elseif (i>4*n) & (i <=5*n)
        y(i) = 3*y1(i-4*n);
    else
        y(i) = 0;
    end
end
end
```



```

noise = 0.1*randn (1,6*n);
y_noisy = y+ noise;
x = 0;
th = 0.5;
window_n= 6*n/10;
last_index =0 ;
for r = 1: window_n
    x_temp = y_noisy ((r*10)-9:r*10);
    e_x_temp = sum (x_temp.^2);
    if e_x_temp < th
        %new_index = new_index;
    else
        new_index = last_index+1;
    end
    y_new(new_index:new_index+9)= x_temp;
    last_index = new_index+9;
end

```

