LAMPIRAN

LIST PROGRAM ALGORITMA ESPRIT PADA MATLAB

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% Direction of Arrival
% ESPRIT (Estimation Signal Parameter via Rotation Invariance Parameter)

% ---------------------------------------------------------------------

% Narrowband Signal Input

signal_doa=str2num(get(handles.signal_doa,'string'));          % DOA of Signal
signal_power=str2num(get(handles.signal_power,'string'));      % Signal Power [Watt]
snrdB=str2num(get(handles.snrdB,'string'));                    % SNR [dB]

signal_radian=(signal_doa*pi)/180;
signal_number=length(signal_radian);

snr=db2pow(snrdB);
noise_variance=signal_power/snr;
% ---------------------------------------------------------------------

% Array Antenna Input and Uniform Linear Array (ULA)

array_elements=str2num(get(handles.array_elements,'string')); % Array Elements
array_distance=str2num(get(handles.array_distance,'string'));  % Array Elements
Distance
array_snapshot=str2num(get(handles.array_snapshot,'string')); % Array Snapshot

A=exp(-i*2*pi*array_distance*(0:array_elements-1)'*sin([signal_radian(:).']));

% ---------------------------------------------------------------------

% Signal and Noise Generator

signal=round(rand(signal_number,array_snapshot))*2-1;
s=diag(sqrt(signal_power*signal_number))*signal;
n=sqrt(noise_variance/2)*(randn(array_elements,array_snapshot)+i*randn(array_eleme
nts,array_snapshot));

% ---------------------------------------------------------------------
```

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% Array Correlation Matrix

C=A*s+n;
Cxx=C*C'/array_snapshot;
[Q,D]=eig(Cxx);
[D,I]=sort(diag(D),1,'descend');
Q=Q(:,I);
Q_signal=Q(:,1:signal_number);
Q_noise=Q(:,signal_number+1:array_elements);

% ------------------------------------------------------------------------

% ESPRIT

phi=linsolve(Q_signal(1:array_elements-1,:),Q_signal(2:array_elements,:));
ESPRIT=asin(-angle(eig(phi))/(2*pi*array_distance))*180/pi;

set(handles.result_ESPRIT,'string',num2str(ESPRIT));

% ------------------------------------------------------------------------
```