Estimation :

1. Static model – The least squared estimator : **weak\_9.docx**
   1. The measurement error is the same statistics

Given data

1. The batch type estimator is
2. The recursive type estimator is

Initial estimator

,

1.2 The measurement errors are different

Measurements:

The best estimator for

1. Dynamic Model :
   1. Batch type : Linear regression (PG\_Ind\_Ch4.docx)

For ,

Find the best estimator for

Then the best estimator for A is

The best linear regression result is

* 1. Batch type: ARX(Auto Regressive eXogenous) model estimation using matlab special command(Iden\_Ch6\_Dynamic\_LSE.m)

Given the model as

* Problem : given ‘N’ input and measurements , find the best linear estimators for

1. Matlab command “arx”

[sys = arx(data,[na nb nk])](https://www.mathworks.com/help/ident/ref/armax.html#d117e2914) :

na = “y” delayed time : na =0

nb = “u” the longest delayed time : nb = 2

nk = “delayed time between y(t) and u(t)” : nk= 1

1. Example: Let a system model

* Generate output data with input “random binary sequence”

% define the system:

% generate input (in this case “random binary sequence”) and noise

% generate output

% generate regressor matrix

% Least Square Estimator LSE

results:

>>

% comments:

Real values :

* 1. Batch type: ARMAX (Iden\_Ch6\_Dynamic\_LSE.m)

Given the model as

* Problem : given ‘N’ input and measurements , find the best linear estimators for

1. Matlab command “armax”

matlab command:

[sys = armax(data,[na nb nc nk])](https://www.mathworks.com/help/ident/ref/armax.html#d117e2914)

na = “y” delayed time : na =2

nb = “u” the longest delayed time : nb = 2

nc = “e” delayed time : nc = 1

nk = “delayed time between y(t) and u(t)” : nk= 1

1. Example: Let a system model

* Generate output data with input “random binary sequence”

% define the system:

% generate input (in this case “random binary sequence”) and noise

% generate output

% generate regressor matrix

% Least Square Estimator LSE

Results:

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* 1. Real time: Moving average(alphaTest\_kim.m, PredictionImportant.m,

PredictionImportant.pptx)