

## ***C. IOIA CALCULATION – MATLAB PROGRAM***

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% This program calculates the IOIA for a system presented in the state space model
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% Calculation of the transformed matrices E & F

E = C*A*pinv(C) ;
F = C*B - Ei*D ;

% Rearrangement of the matrices E & F to the form as in the example
%  $y_1 = (-1/E_{11}) * [(E_{12} y_2 + E_{13} y_3 + \dots) + (F_{11} u_1 + F_{12} u_2 + \dots)]$ 

EE = -diag(diag(E)) ;
transf1 = ones(size(E))./(EE*ones(size(E))) ;
transf = diag(transf1)*ones(1,size(F,2));
transe = transf1.*(ones(size(E))-eye(size(E))) ;

% Rearranged E & F

Er = transe.*E ;
Fr = transf.*F ;

% Calculation of the steady state gain matrix

G = C*(-inv(A)*B)+D ;

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% Calculation of IOIA

$$\text{IOIA} = \text{Fr} ./ (\text{G} - \text{Fr})$$

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