Model Documentation of the 'NN6'

1 Nomenclature

1.1 Nomenclature for Model Equations

- x state vector
- u control input vector
- w noise vector
- z regulated output vector
- y measurement vector

2 Model Equations

State Vector and Input Vector:

$$x \in \mathbb{R}^9 u$$
 $\in \mathbb{R}^1 w \in \mathbb{R}^9 z$ $\in \mathbb{R}^9 y \in \mathbb{R}^4$

System Equations:

$$\dot{x}(t) = Ax(t) + B_1 w(t) + Bu(t) \tag{1a}$$

$$z(t) = C_1 x(t) + D_{11} w(t) + D_{12} u(t)$$
(1b)

$$y(t) = Cx(t) + D21w(t) \tag{1c}$$

Outputs: z



2.1 Exemplary parameter values

Symbol	Value											
	0	1.0	0	0	0	0	0	0	0			
	$\begin{bmatrix} 0 & - \\ 0 & \end{bmatrix}$	-20.0	$-4.2 \\ 0$	$\begin{array}{c} 0 \\ 1.0 \end{array}$	$\frac{4.45}{0}$	$12.5 \\ 0$	$0 \\ 0$	$\frac{100.0}{0}$	$\begin{bmatrix} 0 \\ 0 \end{bmatrix}$			
	0	4.7	8.35	0	-1.1	0	0	0	0			
A	$\begin{vmatrix} 0 \\ 0 \end{vmatrix}$	0	0	0	-3.3	0	0	0	0			
	0	0	0	0	0	0	1.0	0	0			
	1	10.9	0	0	-2.55	-250.0	0	0	0			
	0	0	0	0	0	0	0	0	1.0			
		5.9	0	0	-1.39	0	0	-3700.0	0]			
	$\begin{bmatrix} 0 \\ 0 \end{bmatrix}$											
В	0											
	3.3											
	0											
	$\begin{bmatrix} 0 \\ 0 \end{bmatrix}$											
	0											
	0											
B_1	$\begin{vmatrix} 0 \\ 3.3 \end{vmatrix}$											
D_1	$\begin{bmatrix} 3.3 \\ 0 \end{bmatrix}$											
	$\begin{bmatrix} 0 \end{bmatrix}$											
	0											
	$\begin{bmatrix} 0 \end{bmatrix}$	00==0	a .	0		0			0	0	0	
	3.16	$\frac{227766}{0}$	3.162	0 2776)	s	0	0		$0 \\ 0$	$0 \\ 0$	0 0	
		0		21100 0		5227766	C		0	0	0	
C_1		0		0	0.20		3.1622		0	0	0	
		0		0		0	C		16227766	0	0	
		0		0		0	0		0	3.16227766	0	
		0		0		0	0		$0 \\ 0$	0 0	3.16227766	3.1
		0		0		0	C		0	0	0	0.1
	1.0	0	0 0	0	0	0 0	0]				
C	0	1.0	0 0	0	0	0 0	0					
C	0		1.0 0	0	0.66	0 1.2						
	0 0	0	$ \begin{array}{cccc} 0 & 1.0 \\ 0 & 0 & 0 \end{array} $		$\begin{bmatrix} 0 \\ 0 \end{bmatrix}$	0.66 0	1.2	J				
	0 0		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		$\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$							
	$\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		$\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$							
	0 0	0	0 0 0	0	0 0							
D_{11}	0 0		0 0 0		0 0							
	$\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		$\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$							
	0 0		$\begin{array}{ccc} 0 & 0 & 0 \\ 0 & 0 & 0 \end{array}$		$\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$							
	0 0) 0	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		0 0							
	0	1			3							
	0											
	$\begin{bmatrix} 0 \\ 0 \end{bmatrix}$											
D_{12}	$\begin{bmatrix} 0 \\ 0 \end{bmatrix}$											
$ u_{12} $	0											
	0											

3 Derivation and Explanation

This model is part of the "'COMPleib"' - library and was automatically imported into ACKREP.

The original description was:

NN6 H. P. Horisberger and P. R. Belanger, "Solution of the Optimal Constant Output Feedback Problem by Conjugate Gradients", TOAC, Vol. 19, pp. 434-435, 1974 ehemals HB1

4 Simulation

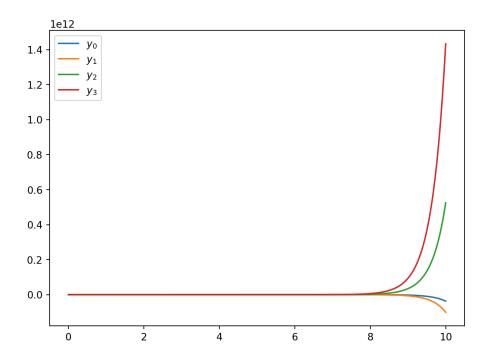


Figure 1: Simulation of the NN6.

References

[1] . P. Horisberger and P. R. Belanger, "Solution of the Optimal Constant Output Feedback Problem by Conjugate Gradients", TOAC, Vol. 19, pp. 434-435, 1974