Routh stability analysis

The characteristics equation is:

$$p(s) = a_n s^n + a_{n-1} s^{n-1} + \cdots + a_1 s + a_0 = 0$$

Then construct the following matrix from the coefficient of characteristics equation and contain n+1of rows:

1	a_n	a_{n-2}	a_{n-4}
2	a_{n-1}	a_{n-3}	a_{n-5}
3	G_1	G_2	G_3
4	F_1	F_2	F_3
$\vdots$	$\vdots$	$\vdots$	$\vdots$
$n+1$	N_1	N_2	N_1

$$G_1 = \frac{a_{n-1}.a_{n-2} - a_n.a_{n-3}}{a_{n-1}}$$

$$G_2 = \frac{a_{n-1}.a_{n-4} - a_n.a_{n-5}}{a_{n-1}}$$

$$F_1 = \frac{G_1.a_{n-3} - a_{n-1}.G_2}{G_1}$$

$$F_2 = \frac{G_1.a_{n-5} - a_{n-1}.G_3}{G_1}$$

We select the first column and if all elements of this column is positive and no change of sign then the system is stable.

If change of sign of this column then the system is unstable.