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H/MHSDI/091

Mechatronics Eng
H00 LVL

Servo Mechanism and control system
EEE HHI

(1) The root locus technique is a graphical method for examining how the roots of a system change with variation of a certain system parameter, commonly a gain within a feedback system. This is a technique used as a stability criterion in the field of classical control theory which can determine stability of the system. The root locus plots the poles of the closed loop transfer function in the complex s -plane as a function of a gain parameter.

(2) for ~~error~~ when an entire row is zero on the Routh table in order to find stability in this case we will find an auxiliary equation, which can be formed by using the elements of the row, just above the row of zeroes in the Routh array and after finding the auxiliary equation we will differentiate it to obtain element of the zero row if there is no sign change in the new Routh array formed by using auxiliary equation, then we conclude the system given is limited stable while in all other cases we would say the given system is unstable.

(b) To determine the poles on the jw axis; ~~just the number~~
~~of sign changes in the first column will be~~

When the table is completed, the number of sign changes in the first column will be number of ~~any~~ non-negative poles. But sometimes the coefficient of the fourth table in a whole row become zero & thus further calculation of the element of the array is not possible. (i.e. table cannot be completed). This happens when there exist conjugate poles on the imaginary axis. In this case we must use ~~the imaginary axis in this case~~ the auxiliary polynomial, which is built from the coefficients of the last non-zero and then differentiate it.