

Verghese, George C.; Lévy, Bernard C.; Kailath, Thomas

A generalized state-space for singular systems. (English) Zbl 0541.34040

IEEE Trans. Autom. Control 26, 811-831 (1981).

The paper deals with linear systems that can be described by means of the equations $E\dot{x}(t) = Ax(t) + Bu(t)$, $y(t) = Cx(t)$, $t > 0$, where the matrix E is singular. Several concepts known from the case when E is nonsingular are adequately extended to the singular case. For instance, the concepts of controllability and observability are discussed. Also, a concept of (strong) equivalence is proposed. It is then shown that two systems are strongly equivalent, if and only if they have the same transfer function. A rich bibliography is given, and connections with previous results are illustrated.

Reviewer: [C.Corduneanu](#)

MSC:

[34H05](#) Control problems involving ordinary differential equations

[93B05](#) Controllability

Cited in **6** Reviews
Cited in **288** Documents

Keywords:

[controllability](#); [observability](#); [equivalence](#)

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