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Unbiased information filtering for systems with missing measurement based on disturbance estimation. (English) [Zbl 1395.93533](#)

J. Franklin Inst. 353, No. 4, 936-954 (2016).

Summary: This paper designs the information filters for a class of linear discrete-time systems with unknown disturbance. A recursive three-step information filter (RTSIF) is presented at first, which is used to estimate the unknown disturbance and state separately. In the presence of measurement dropout, a recursive three-step information filter with missing measurement (RTSIFMM) is also developed, in which the missing measurement is modelled as Bernoulli process with a binary variable. Two types of stochastic stability are introduced to give the boundedness of proposed filter. It is shown that the estimation error will be bounded, if some assumptions are satisfied. The relationships between the designed filter in this paper and some existing results are given. Finally, a simulation example is applied to demonstrate the effectiveness of the proposed filter.

MSC:

- [93E11](#) Filtering in stochastic control theory
- [93E10](#) Estimation and detection in stochastic control theory
- [93B51](#) Design techniques (robust design, computer-aided design, etc.)
- [93C55](#) Discrete-time control/observation systems
- [93E15](#) Stochastic stability in control theory
- [93C05](#) Linear systems in control theory

Cited in 1 Document

Keywords:

[unbiased information filtering](#); [missing measurement systems](#); [disturbance estimation](#); [linear discrete-time systems](#); [stochastic stability](#)

Full Text: [DOI](#)

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