

Keller, J. Y.; Summerer, L.; Boutayeb, M.; Darouach, M.
Generalized likelihood ratio approach for fault detection in linear dynamic stochastic systems with unknown inputs. (English) Zbl 0869.93045
Int. J. Syst. Sci. 27, No. 12, 1231-1241 (1996).

The aim of this paper is to extend the generalized likelihood ratio (GLR) test to stochastic dynamic systems with unknown inputs. Necessary and sufficient conditions to design a stable modified Kalman filter are given. Moreover, a fault detection and isolation procedure based on the GLR test and a geometrical detectability condition of faults are developed. Finally, a numerical example illustrating the failure detection algorithm is presented.

Reviewer: [K.Marti \(Neubiberg\)](#)

MSC:

[93E10](#) Estimation and detection in stochastic control theory
[90B25](#) Reliability, availability, maintenance, inspection in operations research

Cited in **3** Documents

Keywords:

[generalized likelihood ratio test](#); [unknown inputs](#); [Kalman filter](#); [fault detection and isolation](#); [detectability](#)

Full Text: [DOI](#)

References:

- [1] BASSEVILLE, M. , and NIKIFOROV, I. V. , 1993 , series edited by Th. Kailath (Prentice Hall).
- [2] BEARD , R. V. , 1976 , Report MVT-71-1 , Man Vehicle Laboratory , MIT , Cambridge , Massachusetts, U.S.A .
- [3] BUENO R., IEEE Conference on Decision and Control (1976)
- [4] DOI: 10.1109/TAC.1980.1102404 · Zbl 0444.93018 · doi:10.1109/TAC.1980.1102404
- [5] DOI: 10.1109/TAC.1984.1103593 · Zbl 0542.90040 · doi:10.1109/TAC.1984.1103593
- [6] CLARK R. N., IEEE Transactions on Aerospace and Electrical Systems (1975)
- [7] DAROUACH M., IEEE Transactions on Automatic Control 39 (1994)
- [8] DAROUACH M., IEEE Transactions on Automatic Control 39 (1994)
- [9] GUSTAFSON D. E., IEEE Transactions on Biomedical Engineering 25 (1978)
- [10] DOI: 10.1016/0005-1098(84)90098-0 · Zbl 0539.90037 · doi:10.1016/0005-1098(84)90098-0
- [11] JONES , H. L. , 1973 , Ph.D. thesis , Department of Aeronautics and Astronautics , MIT , Cambridge , Massachusetts, U.S.A .
- [12] DOI: 10.1109/TAC.1980.1102245 · Zbl 0443.93012 · doi:10.1109/TAC.1980.1102245
- [13] Lou X. C., IEEE Conference on Decision and Control (1983)
- [14] DOI: 10.1016/0005-1098(71)90028-8 · doi:10.1016/0005-1098(71)90028-8
- [15] DOI: 10.1109/TAC.1974.1100558 · doi:10.1109/TAC.1974.1100558
- [16] SCHWEPPE , F. C. 1973 , (Englewood Cliffs , New Jersey, U.S.A . Prentice Hall).
- [17] TANAKA S., Fault Diagnosis in Dynamic Systems-Theory and Applications (1990)
- [18] VISWANADHAM N., Control-Theory and Advanced Technology 3 (1987)
- [19] DOI: 10.2514/3.27844 · doi:10.2514/3.27844
- [20] WILLISKY A. S., IEEE Conference on Decision and Control (1974)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.