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A State Estimation Method for Sound Environment System with Unknown Observation Mechanism by Introducing Fuzzy Inference

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ABSTRACT

The observed phenomena in real sound environment system often contain uncertainty such as the additional external noise with unknown statistics. Furthermore, there is complex nonlinear relationship between the specific signal and the observations, and it cannot be exactly expressed in any definite functional form. In these situations, it is one of reasonable analysis methods to treat the objective sound environment system as a fuzzy system. In this study, a state estimation method for a specific signal under the existence of an unknown observation mechanism and external noise of unknown statistics is proposed by introducing fuzzy inference. The effectiveness of the proposed theoretical method is experimentally confirmed by applying it to the actually observed data in the sound environment.

KEYWORDS

State Estimation; Sound Environment System; Unknown Observation Mechanism; Fuzzy Inference

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