POWER SYSTEM STATE ESTIMATION USING A ROBUST ESTIMATOR

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Abstract:
State estimation (SE) is a primary data processing algorithm which is utilised by the control centres of advanced power systems. The most generally utilised state estimator is based on the weighted least squares (WLS) approach which is ineffective in addressing gross errors of input data of state estimator. This paper presents an innovative robust estimator for SE environments to overcome the non-robustness of the WLS estimator. The suggested approach not only includes the similar functioning of the customary loss function of WLS but also reflects loss function built on the modified WLS (MWLS) estimator. The performance of the proposed estimator was assessed based on its ability to decrease the impacts of gross errors on the estimation results. The properties of the suggested state estimator were investigated and robustness of the estimator was studied considering the influence function. The effectiveness of the proposed estimator was demonstrated with the help of examples which also indicated non-robustness of MWLS estimator in SE algorithm.

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