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Selection of Power System Variables for Binary-Class Support Vector Machine in Static Security Assessment of Power System

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Abstract : Determining the correct decision for the current power system operating scenario is crucial for the operator to ensure a reliable and secure power system. The limitations of traditional power flow frameworks include higher memory requirements and longer computation times. Therefore, it is not a practical solution for applications that require static security assessments in real-time. Additionally, the composite security index was developed to prevent the masking issue resulting from performance indexes based on line loadings and bus voltage deviations for security assessment. As a result, the composite security index has a stronger ability to distinguish between contingency cases involving closer violations. Support vector machines have been used in the solution of the power system static security binary-class classification problem. The performance of the binary-class support vector machine classifier has been shown to be subject to several sets of power system variables. In order to achieve the best feature selections and the lowest rate of misclassification, sequential forward selection has been employed. Two IEEE standard test systems are used to validate the outcomes of the suggested methodology.

Keywords : composite security index, feature selection, static security assessment, support vector machine
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