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Optimal Placement of Phasor Measurement Units Using Gravitational Search Method

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Abstract : This paper presents a methodology using Gravitational Search Algorithm for optimal placement of Phasor Measurement Units (PMUs) in order to achieve complete observability of the power system. The objective of proposed algorithm is to minimize the total number of PMUs at the power system buses, which in turn minimize installation cost of the PMUs. In this algorithm, the searcher agents are collection of masses which interact with each other using Newton's laws of gravity and motion. This new Gravitational Search Algorithm based method has been applied to the IEEE 14-bus, IEEE 30-bus and IEEE 118-bus test systems. Case studies reveal optimal number of PMUs with better observability by proposed method.

Keywords : gravitational search algorithm (GSA), law of motion, law of gravity, observability, phasor measurement unit
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