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A differential evolution based adaptive neural network pitch controller for a doubly fed wind turbine generator system
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Abstract
Extraction of maximum energy from wind and transferring it to the grid with high efficiency are challenging problems. To this end, this study proposes a smart pitch controller for a wind turbine-doubly fed induction generator system using a Differential Evolution (DE) based adaptive neural network. The nominal weights for the back-propagation neural network controller are obtained from input-output training data generated by DE optimization method. These weights are then adaptively updated in time domain depending on the variation of the system outputs. The adaptive control strategy has been tested through simulation of complete system dynamics comprising of the turbine-generator system and its various components. It has been observed that the DE based smart pitch controller is able to achieve efficient energy transfer to the grid and at the same time provide a good damping profile. Locally collected wind data was used in the testing phase. © Maxwell Scientific Organization, 2013.

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