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upper([Original Research])

Enhancing Hydropower Generator Efficiency Through a Neuro-Fuzzy Optimization Approach

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[Abstract]

In this paper, Neuro-fuzzy software tool was used to ensure a design of an optimized hydropower plant model. It was used to estimate the size and technical data in a hydraulic turbine. The neural network software was imbibed into the fuzzy logic controller. Input data of this software are hydraulic site conditions, desired operating parameters namely, water level and flow rate, as well as the desired arrangement. The designed adaptive power stabilizers based on artificial neural networks (ANNs) and Fuzzy logic are meant to adapt themselves to the operating conditions based on input-output response of the system. Result analyses were carried out using Neuro-fuzzy software tool in MATLAB to ensure optimal turbine rotational speed is maintained at a desired real-time response. The real-time controller emphasizes the robustness of Neuro-fuzzy application of the scheme for steady-state rotational stability for turbine spinning in a hydropower system.

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