

# **Neuro-Prony and Taguchi's methodology based adaptive autoreclosure scheme for electric transmission systems**

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## **Abstract-**

**This paper presents a novel intelligent autoreclosure technique to discriminate temporary faults from permanent faults, and accurately determine fault extinction time. A variety of fault simulations are carried out on a specified transmission line on the standard IEEE 9-bus electric power system using MATLAB/SimPowerSystems. Prony analysis is employed to extract data features from each simulated fault. The fault identification prior to reclosing is accomplished by an artificial neural network trained by Levenberg Marquardt and Resilient Back-Propagation algorithms which are developed using MATLAB. Some important parameters which strongly affect the entire training process are fine-tuned to their corresponding best values with the help of Taguchi's method. Test results show the robustness and efficacy of the proposed auto-reclosure scheme.**

**Index Terms-** Adaptive autoreclosure (AR), artificial neural networks (ANNs), Levenberg Marquardt (LM), Prony analysis (PA), resilient backpropagation (RPROP), Taguchi's method.

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