

CEST02\_224

## Fault Diagnosis of Electric Power Systems Based On Extended Spiking Neural P Systems

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### ABSTRACT

This paper presents a new mechanism to extend capability of spiking neural P systems (SN P systems), toward developing intelligent computer technique in parallel computing offers powerful solutions for power systems fault diagnosis, in this paper a technique considers the fuzzy reasoning rules with fuzzy matrix representation based on extend spiking neural P systems (in short, ESN P systems) are applied, to tackle the incomplete and uncertainty of alarm messages obtained from remote terminal units (RTUs) of SCADA systems. A graphical model is built based on backward-reasoning concept to construct the ESN P systems diagnosis models and generalized the design for transmission lines and buses with a clear graphical depiction for the relationships between protective devices and faults, represents all the possible combinations of main, primary and secondary backup protection operations for inferring faults. Case studies are presents to demonstrate the capability and feasibility of the ESN P systems under real fault scenarios, and comparing results with fuzzy reasoning Petri nets (FRPNs).

**Keywords:** Spiking neural power systems, Power systems Fault diagnosis, Fuzzy reasoning Petri nets.