Edwin Benito Mitacc Meza

"Localização de Defeitos em Sistemas de Potência Utilizando um Modelo Neuro-Fuzzy"

In electrical power systems a large number of messages and alarms are transmitted to the control center in case of disturbances. These disturbances are associated with faults that may be of different types and can occur anywhere in the system. In such situations part of the system is isolated in order to eliminate the fault. Protection devices are responsible for detecting the occurrence of a fault and isolating only the faulted section. It is also very important to restore the system normal operating conditions as soon as possible. Then, it is essential that the fault location is determined in a very short time. In the control center the operator usually has to draw conclusions from a large amount of informations, which may be very time-consuming. Other problems such as protection devices failures, communication problems, acquisition of corrupted data, etc. can make the fault location a very difficult task. This work investigates the application of a neuro-fuzzy model for alarms processing and fault diagnosis in power systems, through the construction of artificial neural networks that perform the fuzzy mapping of alarms received in case of disturbances for outputs that reflect the degree of membership on each class (fault ocurrence). Different techniques to establish the fuzzy relations among alarm patterns and fault occurrences in power systems are examined. The proposed model combines the introduction of qualitative information about the problem (fuzzy logic) with fault tolerance and generalization capability (neural networks).