GLOSSARY

Aggregation - The combination of the consequent of each rule in Mamdani fuzzy inference system, preparation for defuzzification.

Antecedent - Input or IF part of fuzzy rule.

Architecture - A description of the number of the layer in a neural network, each layer's transfer function, the number of neurons per layer.

Back Propagation Learning Rule - A learning rule in which weight and biases are adjusted by the error derivative (data) vectors back propagated through the network. Back propagation is commonly applied to feed forward multiplayer networks. Sometimes this rule is called the generalized delta rule (GDR).

Bias - A neuron parameter that is summed with the neuron’s weighted inputs and passed through the neuron’s transfer function to generate the neuron’s output.

Consequent - The output or THEN part of fuzzy rule.

Circuit Breaker - A device which is capable of breaking large value of fault power.

Defuzzification - The process of transforming a fuzzy output of a fuzzy inference system into a crisp output.

Degree of Membership - The output of a membership function, this value is always limited in between 0 and 1. Also known as a membership value or membership grade.

Differential Relay (A.C.) - A relay which operates in accordance with the phase relation between alternating quantities. It has two or more windings.

Differential Relay - A relay which operates in response to vector or scalar difference between two or more electrical quantities. It has two or more windings.

Electromagnetic Relay - A relay which operates on the force exerted by a magnetic field on ferromagnetic parts.

Epoch - The presentation of the set of training (input and/or output) vectors to a network and the calculation of new weights and biases.

Feed Forward Network - A layered network in which each layer only receives input from previous layer.

Fuzzy Logic - A new and strong theory given by L.A. Zadeh for modeling the human reasoning.
Fuzzification — The process of generating membership values for a fuzzy variable using membership functions.

Fuzzy Inference System — The overall name for a system that uses fuzzy reasoning to map an input space to an output space.

Fuzzy Set — A set that can contain elements with only a partial degree of membership.

Genetic Algorithm - This is an algorithm for unorthodox search or optimization.

Hidden Layer—A layer of a network that is not connected to the network output.

Implication — The process shaping the fuzzy set in the consequent based on the results of the antecedent in a Mamdani type FIS.

Inverse Time Lag Relay — A relay in which the time lag varies inversely with the value of the operating quantity. The operating quantity may be current or voltage, giving rise to two of relays e.g. overcurrent inverse time lag relay and under voltage inverse time lag relay.

Input Layer — A layer of neurons receiving inputs directly from outside the network.

LAN — collection of interconnected computer to share the resources.

Learning — The process by which weights and biases are adjusted to achieve some desired network behavior.

Learning Rate — A training parameter that controls the size of weight and bias change during learning.

Log Sigmoid Transfer Function — Most widely used squashing function, characteristic is very similar to human brain that maps the input to the interval [0,1].

MATLAB — Is a software for simulation and modeling of neural network, fuzzy logic and other technologies. Software is developed by Mathworks Inc. USA.

Mamdani Type Inference — A type of fuzzy inference in which the fuzzy sets from the consequent of each rule are combined through the aggregation operator and the resulting fuzzy set is defuzzified to yield the output of the system.

Membership Function (MF) — A function that specifies the degree to which a given input belongs to a set or is related to a concept.

Mean Square Error Function — The performance function that calculates the average squared error between the network outputs ‘a’ and the target output ‘t’.

Neuron — The basic processing element of a neural network.
Operating Force – A force which tends to initiate the energisation of a relay either to close or open the contacts.

Operating Time – The time which elapses between the instant of application of pick-up value and the instant when relay operates its contact.

Over Current Relay – A relay which operates when the energizing current exceeds the operating value of the relay.

Protective Relay – A relay designed to detect dangerous or undesirable abnormal conditions in electrical plant and initiate suitable corrective action.

Restraining Force – A force which opposes the operating force and prevents the energisation of relay.

Resetting Time – The time which the operated relay takes to come back to its initial normal position as a result of a specified sudden change of the operating quantity, the time being measured from the instant at which the changes occurs.

Relay - A device which produces sudden predetermined changes in one or more physical systems on the appearance of certain abnormal conditions in the physical system controlling it.

Relay Unit or Set – A self contained relay unit which along with one or more relay units performs a complex relay function and constitute a complete protective relay.

Simulation - Takes the network input ‘p’ and the network object net, and returns the network outputs ‘a’.

Static Relay – An electrical Relay with no moving parts and contacts.

Supervised Learning- A learning process in which changes in a network’s weight and biases are due to the intervention of any external teacher. The teacher typically provides target.

Thermal Relay – A relay which is actuated by heat generated due to passage of an electric current or some heat response medium.

Training – A procedure whereby a network is adjusted to do a particular job.

Transfer Function - The function that maps a neurons net output ‘n’ to its actual output.

Unsupervised Learning – A learning process in which changes in a network’s weights and biases are not due to the intervention of any external teacher.