Evaluating Effectiveness of Fuzzy Logic as an Interface for Artificial Neural Network

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User Interface

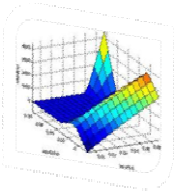
User interface is a program that controls and manages interaction of users with system to facilitate the better and friendly use of the system. The creditability of the system depends on its user interface. Although the functionality that an application provides to users is important, the way in which it provides that functionality is also important. The users' opinion about the system is highly affected by its interface.

Design of a user interface must take account of the human factors. The user interface should be designed using user's terminology and conception of his or her job. Further, the interface should hide unnecessary technical information from its users. A good understanding of the cognitive and behavioural characteristics of people in general as well as the particular user population is thus important.

There are several modern artificial intelligent techniques including Artificial Neural Network (ANN) that possess ability to learn from large data set and behave in intelligent fashion to impart human like decision making. Such soft computing techniques contribute a lot in effectively solving problems of real life. However, these methods lack friendly interface and require technical background. That reduces the degree of usability of such systems in general. To incorporate natural and human like vagueness and imprecision into such system in order to improve their scope and usability, fuzzy logic is suggested.

Fuzzy Logic as Interfacing Technique for ANN

Fuzzy logic (FL) is a set of mathematical principles for knowledge representation based on degrees of membership. FL is multi-valued logic and deals graded membership. The intended research work identifies significance of user interface design in problem solving. The research work is aimed at studying different types of user interfaces and limitations with each type of user interface. Moreover, parameters to measure effectiveness of user interface are to be determined. Parameters like user friendliness, human like representation of inputs, aesthetic appeal, transparency and explanation are identified.



The research work studies the limitations of ANN system like lack of proper interface, lack of explicit explanation and reasoning facility, as knowledge is stored in its connections. ANN works with normalized data that is very unfriendly with user. The study ascertains that effective user interface is an immediate concern for ANN. The research work evaluates characteristics of FL that will help prove that FL is an appropriate interface technique. The study concludes that FL better represents human like vagueness in form linguistic of variables, explicit explanation, and uncertainty and imprecision. To demonstrate the findings, a case of employee evaluation using ANN with a fuzzy interface is planned.