Research Interest May 2017

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My research interests are the followings: Softcomputing, Digital Signal Processing, Control Systems, Pattern Recognition.

I have done set of research projects and published papers that are given in my CV. Currently, I have several projects. Some of them I opened with my MSc and PhD students.

My first project is the "Emerging Trends in Fuzzy Systems: Z Number Based Fuzzy Systems, Theory and Practical Applications".

In this project, I am considering the design of the reasoning mechanism for Z number based fuzzy rules, also the design of Z number based neuro-fuzzy systems. The rules of the fuzzy systems are basically constructed using the knowledge of experts or experienced specialists. Fuzzy logic allows to handle uncertain and imprecise knowledge and provides a powerful framework for reasoning. The design of the proper rules and also the reliability of the linguistic values of the variables in the rule bases are an important issue in the modelling of the systems. Taking into consideration the reliability degree of fuzzy values used in the fuzzy If-Then rules the design of decision-making module acquires importance. The description of this decision-making mechanism is very hard and its simulation is difficult. Zadeh suggested Z-number deal with uncertain information with the degree of its reliability. Z number provides fuzzy restriction and reliability information.

The use of Z numbers in decision making, control and modelling needs to use efficient inference mechanism for the designed system. In this project, the design of the reasoning mechanism for Z number based fuzzy rules, also the design of Z number based neuro-fuzzy systems are considered. The designed method will be applied for decision-making in business, engineering and science, and also for solving of identification and control problems of dynamic plants, robotics.

My second project is "Diagnosis of a cancerous area using images that exist in the Department of Radiology and Pathology of Near East University Hospital using Artificial Intelligence Program and Analysis of Subatomic Particles in Cern". In this project the researchers and PhD. students from different specialists are taking part.

My third project is related to the design of decision-making mechanism and fuzzy control algorithms of soccer robots using Fuzzy logic theory. I do this project with my students in the Robotic research group.

My fourth project is the use of machine learning techniques for classification of breast tissue. An electrical impedance spectroscopy method was used for data acquisition while BPNN and RBFN were the models implored for the execution of the classification task. In future research, we are going to use fuzzy theory in the design of classification system.