

## FUZZY SYSTEM IDENTIFICATION: A FIREFLY OPTIMIZATION APPROACH

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### ABSTRACT

Soft Computing based algorithms are very important way of designing knowledge based systems which are comparatively large and highly complex. Designing a system for the academic evaluation of a university or an institution of higher learning is a complex task as it involves large number of parameters to be considered which are difficult to measure. In this paper fuzzy logic based system for academic rating of institutions of higher learning is designed using firefly (FA) optimization approach. A fuzzy model identification problem is formulated as minimization problem and the model is identified by applying FA optimization based approach. All the input parameters and their membership functions along with the consequents for the rules of the rule base are modified randomly to find the desired values for the system with minimum MSE. Here we have taken 14 inputs each with four MFs and 136 Rules. The performance of the FA is compared with that of BB-BC and Parallel BB-BC [1, 2, and 3] based optimization approaches.

**KEYWORDS:** Firefly Optimization Approach, Fuzzy Logic Based Systems, Membership Functions, Simple and Parallel Big Bang-Big Crunch Optimization Approaches