

PREFACE

The thesis entitled “Soft computing theories and techniques: their uses in solving computing and optimization problems” is submitted for the award of the degree of doctor of philosophy in Computer Science, Faculty of Engineering and Technology, Jagannath University, Jaipur. It embodies the investigations carried out under the guidance and supervision of Dr. Vivek Kumar Sharma, Assistant Professor, Department of Mathematics, Faculty of Engineering and Technology, Jagannath University, Jaipur.

The entire work reported in the present thesis consisting of six chapters including the introduction chapter, is based on the following research papers:

1. Design and Implementation of Modified Fuzzy based CPU Scheduling Algorithm. International Journal of Computer Applications (0975 – 8887) 77(17): pp1-6, 2013. Published by Foundation of Computer Science, New York, USA. ISBN: 973-93-80877-76-6DOI: 10.5120/13612-1323
2. Adaptive Neural Fuzzy Inference System for Employability Assessment, International Journal of Computer Applications Technology and Research (IJCATR), Volume 3 Issue 3: pp 159-164 2014. DOI: 10.7753/IJCATR0303.1006
3. Fuzzified Job Shop Scheduling Algorithm, HCTL Open Int. J. of Technology Innovations and Research HCTL Open IJTIR, Volume 7, pp 1-20, 2014.
4. Air Conditioning System with Fuzzy Logic and Neuro Fuzzy Algorithm. In proceedings of Second International Conference on Soft Computing for Problem Solving (SocProS 2012), JKLU, 28-30, 2012. Advances in Intelligent Systems and Computing Volume 236, 2014, pp 233-242, Springer India.

5. Two Way Ducting System Using Fuzzy Logic Control System. In Proceedings of International Conference on Communication Systems (ICCS-2013) 18-20, 2013. International journal of Electronics and Communication Engineering & Technology (IJECET).Volume:4, Issue: 7, pp: 309-317.

The references have been indicated in thesis by serial number and listed in the order in which they are used. The tables and figures are numbered in such a way that digit before period indicates chapter number and digits after period shows their serial number. Numerical design has been carried out through Matlab and depicted through graphs and tables.

This thesis intended to present the Soft Computing techniques and their applications in the field of optimization. Here this concern research focus on two well known Soft Computing techniques named as Fuzzy Logic System and Neural Fuzzy System and find their application in engineering optimization.

It proposed three systems namely fuzzified employability assessment system, fuzzified scheduling and fuzzified ducting system. The employability is calculated with the help of three employability skills named as Education, Personal Development and Understanding Power in employability assessment system. These three skills take as input in fuzzy logic and calculate the employability as output. This thesis also suggests the design and implementation of fuzzy logic control based CPU scheduling and fuzzy logic based job shop scheduling. In the design of CPU scheduling it make use of suitable linguistic variables as input and calculate the output as crisp value for new priority. On the other hand the job shop scheduling deals with some fuzzy logic rules and these rules are based on each operation time of a job. It calculates a new value of execution with the help of operation time of each job for combination of two machines.

This thesis also discusses air conditioning system with fuzzy logic and neuro fuzzy logic and finds the best results. On the other hand design of two way ducting system also proposed. This model work on two ducts, one is supply duct and another is return duct. These ducts are connected between the air cooler and room for maintaining the desired temperature with minimum speed of fan and pump.