ACKNOWLEDGEMENT

Successful completion of any task gives great satisfaction and internal strength regarding the future problems, but at any stage, a person never exists alone. He or she is always accompanied by some people who provide support and suggestion for successful completion of any work. Therefore, it is a matter of great pleasure for me to thank all those people who inspired me and gave their kind hearted support at every stage of my research work.

First and foremost, I bow in great reverence to almighty God, the most gracious, the most merciful, whose bounteous blessings enabled me to accomplish this thesis.

I would like to honor my great institute "Indian Institute of Technology (BHU), Varanasi", where I got a platform to learn the new techniques and concepts that enhanced my skills.

I would like to express my gratitude and sincere thanks to my supervisor and Head of the Department, *Prof. K.K. Shukla*. I am indebted to my guide for his seamless support, advice and guidance throughout my doctoral study. Without his active guidance, valuable suggestions and consistent support, this work would not have been possible. I am extremely grateful to him for giving me his precious time, in spite of his busy schedule, to carry out the fruitful discussions regarding the research work.

I am very grateful to my aunt, *Prof. Ranjana Patnaik*, School of Biomedical Engineering, for her blessings and the encouragement that she gave me to carry out this research work.

I am extremely thankful to *Prof. Rekha Srivastava*, Department of Mathematical Sciences for giving me lessons on fuzzy mathematics.

I would also like to convey my sincere gratitude to the other faculty members of the Department of Computer Science and Engineering, *Prof. R. B. Mishra, Prof. A. K. Tripathi, Prof. A. K. Agarwal, Prof. Rajeev Srivastava, Dr. S. K. Singh, Dr. R. S. Singh, Dr. Bhaskar Biswas* and *Dr. Vinayak Srivastava* for their extensive and inspiring guidance throughout this tenure.

I am enormously grateful to all the members of RPC, *Prof. K. K. Shukla, Prof. Rajeev Srivastava, Dr. Bhaskar Biswas* and *Dr. Neeraj Sharma* for their valuable suggestions, appreciation and encouragement.

My memory of the study period at IIT(BHU) can never be complete without mentioning my fellow research scholars. Special thanks to *Ms. Mridula Verma* and *Mr. Jayadeep Pati* for their great help and cooperation.

I extend special thanks to the non-teaching staff in the Department, particularly, *Mr. R. S. Tripathi*, *Mr. Pramod Kumar*, *Mr. Rajendra Kumar*, *Mr. Kanhaiya Lal, Mr. Ravi Kumar Bharti*, *Mr. Bharat Pandey* and *Mr. Tribhuvan* for their consistent support.

My acknowledgements would not be complete unless I express my heartfelt gratitude and deepest appreciation to *my grandparents*, *my parents*, *my sisters and all my family members* and *friends* for their blessings, support, love, encouragement and sacrifices.

Madhushi Verma

PhD. Research Scholar,

Enroll. No. 338916

Dept. of Computer Science and Engineering, IIT (BHU), Varanasi (India).