

# *Acknowledgements*

This thesis is the end of my journey in obtaining my Ph.D. I have not traveled in a vacuum in this journey. This thesis has been kept on track and been seen through to completion with the support and encouragement of numerous people including my well wishers, my friends, colleagues and various institutions. At the end of my thesis, I would like to thank all those people who made this thesis possible and an unforgettable experience for me. At the end of my thesis, it is a pleasant task to express my thanks to all those who contributed in many ways to the success of this study and made it an unforgettable experience for me.

Firstly, I would like to express my sincere gratitude to my advisor **Dr. Bhaskar Biswas** for the continuous support of my Ph.D study and related research, for his patience, motivation, and immense knowledge. His guidance helped me in all the time of research and writing of this thesis. I could not have imagined having a better advisor and mentor for my Ph.D study.

I specially thank the members of my Research Progress Evaluation Committee, **Prof. K. K. Shukla, Dr. Ravi Shankar Singh, Dr. Subir Das** for their invaluable suggestions regarding the thesis, their insightful comments and encouragement, but also for the hard question which incited me to widen my research from various perspectives.

I would like to express my sincere thanks for **Prof. Rajiv Srivastava**, Head, Computer Science and Engineering Department, for his kindness and valuable support in carrying out the research. I express my sincere thanks to the faculty members, **Prof. A. K. Tripathi, Prof. R. B. Mishra, Prof. S. K. Singh, Dr. Vinayak Srivastava, Dr. R. N. Choudary, Dr. H. P. Gupta, Dr. T. Dutta, Dr. A. K. Singh** and staffs of the department.

I am also thankful to all my friends for the fun moments in my PhD student life. I wish to express my deep sense of thanks to **Mr. Harish Kumar Shakya, Mr. Sumit Jaiswal, Dr. Anupam Biswas, Dr. Vinay Kumar, Mr. Ashish Kumar Maurya, and Dr. Mridula Verma** for being a great friends and the best advisers I could ever have. Their advice, encouragement and critics were always the source of inspiration. This dissertation would not have been possible without their invaluable suggestions and persistent help. I wish to extend my gratitude towards all my lab mates **Mr. Shashank Singh, Mr. Ajay Singh,**

whose company helped me a lot. I am also thankful to **Abhimanyu Singh, Raghav Gupta, Shashank Awasthi**, and **Anurag Singh** for the collaborations and contributions to some of the projects in this dissertation. I am specially thanks to **Mr. Dharmendra Prasad Mahato** without him this study might not come to an end.

Most importantly, my deepest gratitude is for my family for their constant support, inspiration, guidance, and sacrifices. My parents were constant source of motivation and inspiration. Their affection and guidance was instrumental in me choosing Engineering and eventually continuing on to my Ph.D.

Last but not the least, I would like to special thanks is to my wife **Monika**, and my lovely son **Kayaan** for supporting me unconditionally throughout my study. I sincerely thank all of them who contributed in for helping me to see the light at the end of every scary tunnel during my Ph.D.

- Kuldeep Singh