Acknowledgements

This thesis is the result of research I carried out for my Ph.D. study at Jadavpur University. At this stage when I am completing Ph.D. study at Jadavpur University, I am grateful to many people who have contributed and supported directly or indirectly during my Ph.D. study period. I would not have been able to produce this thesis without the great support from them. I would like to take this opportunity to extend my heartfelt gratitude to all of them. If I miss some names to mention this is unintentional and I would like to thank all of them which include those also whose names are not mentioned below.

At the very outset I would like to express my deepest sense of gratitude to my supervisors Prof. Avijit Kar, Department of Computer Science and Engineering, Jadavpur University and Prof. Rajib Mall, Department of Computer Science and Engineering, Indian Institute of Technology Kharagpur, who provided me the opportunity to do this research for my Ph.D. study. I was given freedom to try out new ideas and my supervisors supported me continuously throughout this research period.

Prof. Avijit Kar used to give extremely useful and quality critics on my ideas and related technical issues which helped me immensely in further improving the quality of the work. Prof. Kar always created an inspiring and friendly atmosphere around him and I have learnt a lot from him. I would like to extend my heartfelt gratitude to Prof. Kar.

Prof. Rajib Mall introduced me to the exciting area of wireless sensor networks which at a latter stage I took up as the research area for the Ph.D. study. He has been a source of inspiration throughout. Whenever I talked to Prof. Mall he encouraged me and helped in opening up new ideas. I would like to extend my heartfelt gratitude to Prof. Mall.

I receive great guidance and continuous support from Prof. Kar and Prof. Mall. This association with them has become an asset in my life.

I would like to thank all the members of faculty and staff of the Department of Computer Science and Engineering, Jadavpur University for facilitating me for carrying out the Ph.D. study. I would also like to thank the members of the Distributed Computing Laboratory at Jadavpur University from whom I have received great support and laboratory facility during the Ph.D. study period.

I am thankful to the Center for Theoretical Studies (CTS) at Indian Institute of Technology Kharagpur from where I collected enough relevant research literature during my stay over there as visiting scholar.

I am thankful to the members of the Data Communication Laboratory and the Department of Information Technology at Sikkim Manipal Institute of Technology for facilitating and helping me throughout the research period. I wish to thank specially the entire Sikkim Manipal Institute of Technology family for supporting me all the time.
Moreover, I would like to thank all my friends who have always been supporting me. My special thanks to Bhaskar Bhuyan, Udayan Baruah, Prativa Rai, S.R.Biradar, Nitul Dutta, Hemanta Kumar Kalita and Ambar Dutta with whom I could discuss research problems at different times. With these friends I have spent wonderful time and also have received help at different moment.

Last but not the least, I take this opportunity to thank my parents, brothers & their families, and sister & her family for their unconditional support and encouragement to pursue my interests. I always remember that my parents have been very supportive to me during all the difficulties.

My apologies if I have unintentionally missed anyone to whom acknowledgment is due.

Hiren Kumar Deva Sarma
September, 2011
Jadavpur, W.B., India
PIN 700 032