

ACKNOWLEDGEMENT

I take this opportunity of expressing my deep sense of gratitude, regards and appreciation to my supervisors Dr. Biswapati Jana, Department of Computer Science, Vidyasagar University, West Bengal, India-721102 and Dr. Debasis Giri, Department of Information Technology, Maulana Abul Kalam Azad University of Technology, Nadia, West Bengal, India-741249 for proposing topic of the present Ph.D. thesis and for introducing me to the magnificent field of research in Computer Science. I am deeply indebted to them for their constant encouragement, constructive criticism, wise and valuable suggestions received all through the period of this investigation. Their knowledge, kindness, patience, sincerity, and vision have provided me with lifetime benefits.

Besides my supervisors, I would like to express my earnest and the true sense of gratitude to Mr. Pabitra Pal for his continuous encouragement with his invaluable ideas. I am truly indebted to him for his compassionate support.

I take this privilege to convey my regards to Professor Ranjan Chakrabarti, Honorable Vice-Chancellor and Dr. Jayanta Kishore Nandi, Registrar, Vidyasagar University, for providing me all facilities needed to carry out my research work. I also convey my heartfelt thanks to the faculty and staff members of the Department of Computer Science, Vidyasagar University for their encouragement and help in different ways. I would like to thank all the members of the thesis examination committee: Prof. Satyajit Saha (Convener of PhD Committee), Prof. Madhumangal Pal, Prof. J.K. Mandal, Prof. R.K. Samanta, Prof. Subrata Kumar De (Dean of Science), for their suggestions and advices for improving my thesis work. I convey my sincere gratitude to Professor J. K. Mondal for his help and support.

I would like to express my gratitude to co-researchers Mr. S. Singha, Mr. R. Das, Mr. S. Kanrar, Mr. S. Kaity, Mr. S. Manna for their encouragement and helpful suggestions. I must acknowledge my debt for those who have constantly inspired, en-

couraged and helped me. I acknowledge my debt to Suman Kumar Koley and Subhadip Pal for their continuous support. I ardently acknowledge my debt to Mr. Prabhash Kumar Singh and Mrs. Sharmistha Jana for their co-operation and support to keep the momentum of this research work. I am grateful to Mr. Hemant Kumar Golapalli and Mr. Kuntal Chakraborty for proofreading the manuscript and rectifying the errors in language.

I also acknowledge my debt to the members of my family for their patience and continuous support. It is almost impossible for me to express any formal gratitude to my father Mr. Pravas Chandra Chaudhuri, without whom the execution of this work would not have been possible. At length, I ardently acknowledge my debt to my wife, Mrs. Soma Metya Chaudhuri, who is the source of inspiration for both my research and my life and without whose unstinting efforts this thesis could not have been given a due shape. Throughout the research work, I was also supported by the sweetness of my beloved daughters Parisa and Pritisha. I am forever in debt to my dear mother, Mrs. Smritirekha Chaudhuri, without whose blessings I would not have been successful in this endeavour.

Vidyasagar University

Paschim Medinipur

Date: 28/12/2020



(Partha Chowdhuri)