First and foremost, I would like to register my gratitude to the Almighty the most beneficent and the most merciful, for the innumerable blessings He has bestowed upon me throughout my life, especially during the course of this work.

I thank Dr. A.K. Khaja Nazeemudeen Sahib, Secretary and Correspondent, Janab Hajee K.A. Khaleel Ahamed Sahib, Treasurer and other members of the management committee of Jamal Mohamed College for giving me the opportunity to pursue research in the most prestigious department of this noble institution where I had the privilege of being a staff member for more than eight years.

I extend my thanks to Dr. S. Mohamed Salique, Principal of Jamal Mohamed College for his words of encouragement. I would like to register my thankfulness to Dr. M. Sheik Mohamed, former Principal of Jamal Mohamed College, for reposing so much of trust in my abilities right from the day of registration for this work. I express my heart felt thanks to Dr. R. Khader Mohideen and Dr.A.M.Mohamed Sindhasha, former Principals of Jamal Mohamed College, for their constant support and encouragement.

Words are insufficient to express my indebtedness to my guide and supervisor Dr. D. I. George Amalarethinam, Associate Professor in Computer Science and Director-MCA, Jamal Mohamed College, Trichy. But for his patience, support and stewardship this work just would not have been possible. He gave me full freedom right from choosing the topic of research to deciding the time of submission of the work. His sincere and meticulous checking and correctioning played a vital role in the shaping of this thesis. I register my sincere and heartfelt thanks to him.

As the doctoral committee member, Dr. S. Nickolas, Associate Professor and Head, Department of Computer Applications, National Institute of Technology, Trichy, showed great interest and offered valuable suggestions throughout the work. My profound thanks are due to him.
I would like to thank Dr. Paul Selvaraj, Former Principal, Periyar E.V.R. College(Auto.), Trichy for taking steps promptly to get me permission to register for Ph.D. I thank Dr. N. Selvaraj, Principal, Periyar E.V.R. College(Auto.), Trichy for his support and well wishes.

I thank Dr. G. Ravi, Head, PG & Research Department of Computer Science, Jamal Mohamed College(Auto.), Trichy for readily and always extending his support during the course of this work.

I use this opportunity to record my thanks to all my teachers in the Computer Science department of St.Joseph’s College(Autonomous), Trichy. My special thanks are due to Prof. A. Charles, Associate Professor, Department of Computer Science, St. Joseph’s College, Trichy for taking pains to go through the final version of the thesis and for making corrections and offering suggestions to make it more clear and comprehensible. I thank Dr. D. Ravindran, Dean - Computing Sciences and Associate Professor, Department of Computer Science, St. Joseph’s College, Trichy for offering timely suggestions to improve the presentation of the work.

My sincere thanks are due to Dr. E.George Dharma Prakash Raj, Assistant Professor, School of Computer Science and Engineering, Bharathidasan University and Dr. K. Mani, Associate Professor in Computer Science, Nehru memorial College(Auto.), Puthanampatti, Trichy for sparing their valuable time to help me improve the presentation.

I would like to express my sincere thanks to all my colleagues at Periyar E.V.R. College, Trichy and Jamal Mohamed College, Trichy for their help and support in some way or other. Prof. O. A. Mohamed Jafar, Associate Professor in Computer Science, Jamal Mohamed College(Auto.), offered useful tips in formatting and taking print-outs of the thesis. My heart felt thanks are due to him. Special thanks are due to Dr. T. N. Ravi, Assistant Professor in Computer Science, Periyar E.V.R. College(Auto.) for taking out his precious time to go through some of my research papers and for his well wishes.

All my fellow research scholars at Jamal Mohamed College, especially Dr. C. Balakrishnan, Assistant Professor in B. Voc., Alagappa University, Karaikudi; Dr. V. Sinthu Janita Prakash, Head, Department of Computer Science, Cauvery
College for Women, Trichy; **Dr. F. Kurus Malaiselvi**, Associate Professor and Head, Department of Computer Science, Government College for Women(Auto.), Kumbakonam were very considerate and offered timely help and support. I extend my sincere thanks to all of them.

I would like to thank **Prof. S. Syed Abuthahir**, SASTRA University, Thanjavur, for helping me in acquiring many journal articles through his acquaintances.

At this juncture, I fondly remember my late parents for the hardships they faced and the sacrifices they made to educate me, and pray for their success in the hereafter.

My sisters and my in-laws have been praying for the successful completion of the work. Their prayers and blessings have been accepted and answered by the Almighty. I thank them all for having been so supportive and encouraging all these years.

Last but not the least, I thank my wife and children for being so understanding, cooperative and for ensuring that I concentrate on the research work without any distractions.

**H. KARAMATH ALI**