Acknowledgement

I would like to express my heartfelt gratitude to my supervising guide Dr. Tessamma Thomas, Reader, Department of Electronics, Cochin University of Science and Technology for her valuable guidance as well as for her kind advice, constant encouragement and affectionate support.

I am greatly indebted to Dr. K. V. Menon, Lakeshore Hospital and Research Center, Maradu, Kerala, India, for his valuable suggestions in the work of indexing of scoliosis images and providing me important research materials. I am thankful to the anonymous reviewers of my publications for providing valuable suggestions and motivating comments.

Let me express my sincere gratitude to Prof. K. Vasudevan, Head of the Department of Electronics, Cochin University of Science and Technology, for extending the facilities in the department for my research work. Also, I would like to acknowledge all faculty members of the Department of Electronics, especially Prof. P. Mohanan, for their kind support and help.

I sincerely thank CSIR, India, for providing financial assistance during the period of my research by granting Senior Research Fellowship.

My sincere thanks to Dr. Miroslaw Bober, Visual Information Laboratory, Mitsubishi Electric, Guildford, U.K. for providing the MPEG-7 shape database for my research work. I am also thankful to Dr. L. R. Long, National Library of Medicine (NLM), for providing the NHANES database. I sincerely thank Amrita Institute of Medical Sciences & Research Center for providing the scoliosis image database and Dharma Systems, Inc., Nashua, for providing Dharma SDK Server for implementing the RDBMS support. I sincerely acknowledge the help of Mr. M. Vidyasagar and Mr. D. Bose, Dharma Systems Pvt Ltd, Bangalore.

I am grateful to Dr. P. S. John, Head, Department of Orthopedics, Medical College, Kottayam, for introducing me to the techniques of spinal surgery. I also thank Dr. Antony Joseph Thoppil, and Dr. James Chacko, Medical College, Kottayam, Dr. Binod Kumar Bijukche, Dr. Jim F. Vellara, Amrita Institute of Medical Sciences & Research Center, for their collaboration.

I would like to thank Dr. C. S. Sridhar for his help and motivations provided for my research. I thankfully remember my associations with Dr. V. P. Devassia and Dr. M. G. Mini, IHRD. With great sense of gratitude I thank the selfless assistance of Dr. Joe Jacob, Department of Physics, Newman College, Thodupuzha and Dr. P. B. Vinod Kumar, Rajagiri School of Engineering & Technology. I express my gratitude to Dr. V. Deepu Rajan, Nanyang Technological University, Singapore, for his valuable suggestions during the course of my research. I also thank Dr. A. Unnikrishnan, NPOL, for his encouraging words.
I thank all the research scholars of the department, especially Ms. Deepa Sankar, Mr. Gopikrishnan, Mr. Vinu Thomas, and Mr. Anil Lonappan, for their support. I would like to thank Ms. R. Ananda Reshmi, Mr. J. Linesh and Mr. Roopesh Katan who have collaborated with me. I take this chance to acknowledge Mr. Jimson John, Oracle Corporation and Mr. Benoy Jose, V.S.S.C, for their friendly and supportive attitude. I am also thankful to Dr. Sabu Hameed for helping me in collecting some important research papers. I extend my gratitude to all my friends and relatives for their whole hearted support.

I thank all administrative staff and librarian of the Department of Electronics and Cochin University of Science and Technology for their cooperation and support.

It is beyond words to express my gratitude to my mother and family for their help and encouragement. Without their help and sacrifice, I am sure I could not have accomplished this task.

Dinesh Kumar V. P.