Acknowledgement

I prostrate my heartfelt gratitude to my research guide Dr. A.R. Ganesan, Assistant Professor, Department of Physics, National Institute of Technology, Tiruchirappalli, without whom this work would not have been possible. It was his invaluable guidance and constant encouragement during the course of my research work, which shaped this thesis. He was a great source of inspiration, a fountain of knowledge and a critic with remedy. I greatly appreciate the time he took off his hectic schedules to carefully nurture me to this level of scientific exposure.

My gratefulness to the Director and the Academic Dean, National Institute of Technology, Tiruchirappalli, for permitting me to carry out my Ph.D work in this Institution.

My sincere thanks to Dr. T. Balasubramanian, Head, Department of Physics, National Institute of Technology, for providing the necessary facilities, for his motivation and for creating a conducive atmosphere for my research activities.

I record my thanks to Dr. D. Sastikumar, Assistant Professor, Department of Physics for his valuable suggestions and encouragements during the course my study.

My special thanks to my research colleagues at the Photonics laboratory for their constant support and encouragement. In particular, Mr. L. Praveen Kumar, for his support regarding development of Shack-Hartmann Sensor software works in graphical representation. Mr. M. Jesson for his many constructive remarks and suggestions in Shack-Hartmann based measurement of aberration of human eye studies. I received cooperation from all my colleagues in the department and it was really a pleasure working with them.
Finally, I would like to express my deepest gratitude to my parents for their love, trust and blessings during my entire research period. I thank my wife for her unfathomable sacrifice and unconditional support without which this would never have been possible. Also, I am grateful to my little daughter for bearing with me for three years.

I would like to dedicate this thesis to my entire Gurus those who directly and indirectly motivated me, inspired me and for the wisdom they left with me for a noble task.