## Acknowledgements

This thesis represent not only my work on the keyboard, it is more than one decade of work at Department of Mechanical Engineering, Faculty of Technology & Engineering, The Maharaja Sayajirao University of Baroda and specifically with the Heat Engines Laboratory. It is pleasure to thank many people who have provided assistance over the course of this investigation.

At the onset, I wish to thank my guide and mentor Prof. (Dr.) P. Prabhakaran for providing continuous encouragement and guidance throughout the entire research period. He has been very supportive since the days I began working on the research work. Under his guidance I learned a lot, moreover, he inspired me to become independent researcher. I cannot forget his hard times. Despite of his ill health, he reviewed thesis progress, gave valuable suggestions and corrected the manuscript to improve the quality. The assistance of P. M. Solanki and Mr. M. M. Pathak in maintaining the apparatus is gratefully acknowledged.

I would like to thank scientists from Bhabha Atomic Research Center (BARC), Mr. Prasanna Majumdar, Mr. H. G. Lele, and Mr. Deb Mukhopadhyay for sharing their knowledge that influenced the work.

A very special gratitude goes to Board of Research in Nuclear Science (BRNS), Department of Atomic Energy (DAE), Government of India for providing research fund to carry out the work.

It is a pleasure to thank Head of the Department of Mechanical Engineering, and Dean of the Faculty of Technology & Engineering for allowing me to work freely in the laboratory.

I would like to express my gratitude to my parents Mr. Arun Ekbote and Mrs. Anuradha Ekbote for their blessing. I thank with love to my wife Dr. Madhura Ekbote for understanding me as a Ph.D. student and taking care of me as well as my family during this amazing period. Finally, I extend my deepest thank with love to my sons Samarth and Hitarth for allowing me to spend most of the time on the thesis. For the past several months, my six years old son Samarth kept on reminding me to write thesis by telling "Pappa, do your homework nicely to get star"!

Milind A. Ekbote

October 2017, Vadodara, India.