ACKNOWLEDGEMENT

For the last four years, during which I have been engaged in applied research in the field of fluid power servo-actuation, I find it a unique experience in my life as a student of Mechanical Engineering. This page of acknowledgement is a humble way of expressing my gratitude for those wonderful people directly or indirectly related to my present thesis work.

I would like to express my deepest gratitude and indebtedness to Dr. Dipankar Sanyal — one of my two thesis advisors. I have a dearth of words to express the role he played in the completion of this work. His association and involvement have been the eternal source of pleasure in learning and acquiring knowledge about the art of mathematical modeling and intricacies of numerical computation. I cherish learning and enriching myself from every interaction that I have with him. His constant inspiring guidance and encouragement mostly during the crucial and disheartening moments helped me immensely. His valuable guidance not only has gone a long way in accomplishing the present work, but also will pay greatly in future.

I would also like to express my sincere gratitude to Dr. Swarnendu Sen, my other thesis advisor. It is a great pleasure for me for the opportunity to work with him. At the beginning of this work, for the development of numerical tool, he explained the numerical scheme elaborately. I overcame the complexities of numerical computation and code debugging through his valuable guidance. He taught me the aspects of post-processing the solved results for the desired representation. Whenever I encountered a problem puzzling me, he put me into the right track promptly. Apart from all these details, his inspiration and motivation throughout the course of work is unforgettable.

I would like to convey my deep sense of gratitude to Dr. Saikat Mookherjee for a number of discussions, valuable suggestions and constant assistance.

I would like to express my sincere gratitude to Prof. Soumendra Nath Pal for his relentless support that he has extended to me to carry out this work.

I would also like to express my earnest gratefulness to Prof. Kamalesh Majumder for his advices, guidance and encouragement.

It is a bit of luck for the author for working in association with the wonderful Neptune Group. I would like to express my gratitude for all the members of Neptune Team, namely Dr. Achintya Mukhopadhyay, Dr. Sanjib Acharyya, Prof. Arun Bhattacharyya, Prof. K. C. Das, for the inspiration to go on. I would like to thank Prof. K. C. Das for providing all the experimental data and for sharing the experimental knowledge.
Before I miss to remember, I must mention one more name, who has done a lot of things for me and also brought me here, to this wonderful place. He is Dr. Snehamoy Majumder of this Mechanical Engineering Department of Jadavpur University, one of author's best friends. I would like to express my heartiest gratitude to him.

The encouragement and company of my fellow researchers especially Rajarshi, Manish, Anujit are unforgettable.

I would like to express my heartiest gratitude to my parents and elder brother for their motivation, inspiration and support to accomplish the work.

Lastly, I am thankful to all who have assisted me directly or indirectly to complete this work.