

ACKNOWLEDGMENT

This Ph.D research work has been a wonderful and overwhelming experience. This thesis is the result of work whereby I have been accompanied and supported by many people. It is a pleasant aspect that, now I have the opportunity to express my gratitude for all of them. Firstly, I am thankful to the Almighty, Who is the first cause of my existence.

I am deeply grateful to the honorable Chancellor Dr. S.J Chopra, Mr. Utpal Ghosh (President & CEO, UPES), Dr. Srihari (Vice Chancellor, UPES), Dr. Kamal Bansal (Dean, CoES, UPES), Dr. Suresh Kumar (Director, CoES, UPES) and Dr. Sushabhan Choudhury (H.O.D, Electronics Instrumentation and Control Engineering, UPES), for providing me the opportunity to complete my Ph.D from UPES.

With immense pleasure I express my sincere gratitude, regards and thanks to my guides Dr. Piyush Kuchhal (Professor & Associate Dean, CoES, UPES) and Dr. Adesh Kumar (Assistant Professor (SG), CoES, UPES) for their invaluable suggestions and guidance. They have been a steady influence throughout my research work and supported me with promptness and care, and have always been patient and encouraging in times of new ideas. This journey of learning has been a real pleasure. My sincere thanks to Dr. Rajesh Singh who has always been there in the time of difficulties and being a constant inspiration for my work.

In addition I am grateful to my family, friends, relatives and colleagues for their moral support and blessings.

ANITA