## **ACKNOWLEDGEMENTS**

I am extremely grateful to my supervisors Professor Dr. R K Tripathi and Dr. Parag Diwan for their valuable guidance, ever helping attitude, critical and encouraging comments throughout the completion of this research work.

I would like to express a deep sense of gratitude to the Chancellor Dr. S. J. Chopra, Vice Chancellor Dr. Shrihari Honwad and the R&D Department, University of Petroleum & Energy Studies for their continuous encouragement and support.

I am very grateful to Dr Kamal Bansal (Dean, CoES), Prof. S C Gupta (Associate Dean, CoES), Dr. Vikas Garg (HoD, Civil Engineering, UPES), Prof N B Soni (HoD, Electrical Engineering, UPES) Dr. Suresh Kumar (Associate Dean, CoES), Dr. Rajneesh Garg (Professor), Dr. Mukesh Saxena (PVC-UTM), Mr Ashish Deshpande (Principal Technologist, Rolls-Royce, Singapore), Dr. Piyush Kuchhal((Associate Dean, CoES), Dr P K Sahoo (Orissa University of Agriculture & Technology, Bubaneswar)

I am also thankful to Mr Venkatesh PS (Manager R& D, Ark Info Solutions, Bangalore), Dr. Gautam Lalwani (MBM Engineering College, Jodhpur) Prof. Narayan Khatri, Prof. Vijai M Kishore, Prof A N Shannkar, Prof. Susanta Sethy, UPES, Prof. Ravi Shrivastava (NICMAR, Indore), Prof Aniruddha G Banhatti (GHRCEM, Pune), Mr Abdul Wahid (Mansar Robotics, Pune), Mr Amit Sharma, Research Scholar – UPES

Due to the pre occupation with the priorities for the research project, my papa Mr Ghan Shyan Gattani, mom Mrs Jyana G Gattani and life partner Sunita M Gattani and all family members were deprived of the privileges and prerogatives which God has bestowed on them. Their patience and kind understanding & cooperation have always been a morale booster for me.

I would like to thank all who directly and indirectly supported and helped me to carry out the research project.

(Manoj Kumar Gattani)