## Acknowledgments

I take this opportunity to thank all those people who made my PhD such an amazing and adventurous journey. Firstly and most importantly, I would like to express my deep gratitude to my Supervisor, *Dr. Aritra Banik*, for his generous guidance and for introducing me to field of parameterized complexity. In the process, I learnt many technical and non-technical aspects of professional work. I am grateful to him for his continuous encouragement and optimism. This thesis would not have been possible without his support. I also thank my another Supervisor, *Dr. Subhashish Banerjee* for his guidance. His support has been a great source of strength that enabled me to overcome tough times during my PhD tenure. I am also indebted to the Members of my Doctoral Committee *Dr. Venkata Ramana Badarla*, *Dr. Gaurav Harit* and *Dr. K R Chowdhary* for their guidance.

I would like to extend my deepest gratitude to my co-authors and mentors Prof. Saket Saurabh, Prof. Venkatesh Raman and Fahad Panolan. I learnt a lot from them. I thank Prof. Saket Saurabh for hosting my visit to University of Bergen. It was a great experience professionally as well as personally.

I am indebted to my labmate and wonderful friend *Pratibha Choudhary* for being always there for me and cheering me up. I also extend my thanks to my friends *Ridhi*, *Dipti*, *Abhra*, *Shilpa*, *Shakti*, *Shirish*, *Vinay*, *Sonal*, *Shivanjali*, *Nidhi*, and *Jaspreet*, for all their help and the liveliness they infused in my life at IIT Jodhpur.

I am short of words in expressing thanks to my mother and my father for being such wonderful parents. I love you both. I thank my sister *Pooja* and my brother *Mayank*, my Nanaji and Naniji for the patience and love which they showered on me. I pay respects to all these wonderful people for their *love*, *sacrifices and blessings*. I am so fortunate to have you in my life ...

Last but not the least, I would say special thanks to Ashayam Gupta for all his support and for bearing with me even during my periods of frustration. I am appreciative of his kind patience towards me.

Vibha Sahlot PG201282012