Acknowledgments

It is my great pleasure and privilege to express my deep sense of gratitude and everlasting indebtedness to my research supervisor, Dr. Sumanta Pasari, Department of Mathematics, Birla Institute of Technology and Science (BITS), Pilani (Pilani Campus), for his continuous encouragement and guidance with full of patience, motivation, moral support, enthusiasm, and immense knowledge. I am fortunate to get an opportunity to work with him on the problem "Measuring and Modeling Crustal Deformation along the Himalayan Arc". His guidance helped me immensely in carrying out research outcomes and in writing journal papers and Ph.D. thesis.

I would like to express my special thanks to Prof. Kuo-En Ching, National Cheng Kung University, Taiwan for teaching me various geodetic models like my another supervisor. His punctuality, gentleness, and inspiring personality are a constant source of motivation. I feel extremely fortunate to work with such a dedicated and supportive researcher from Taiwan. I also thank him for providing me his permanent as well as campaign GPS setups.

I am thankful to the Vice-Chancellor, Director, Dean Academic (AGSRD), Associate Dean (SRCD), and Registrar of BITS Pilani for giving me chance to achieve a challenging position in a respective field pertinent to my qualification which allowed me to use my skills to prove myself worthy. I am further thankful to them for providing me the facilities regarding research work and a healthy environment.

It is an honor for me to be a doctoral student at the Department of Mathematics, BITS, Pilani. I would like to express my devout thank to Prof. Balram Dubey, Prof. B. K. Sharma (Ex. HoDs) and currently Prof. Devendra Kumar, HoD, Department of Mathematics who provided me a golden opportunity to work in the Department of Mathematics and in finalizing this work within time and throughout the entire procedure. I would like to acknowledge all the faculty members and staff of the Mathematics Department for their valuable support and cooperation during my research work.

I am also thankful to the doctoral advisory committee (DAC) members Prof. Rakhee and Prof. Udayan Chanda for their valuable comments and suggestions during my Ph.D. research work.

I thank Dr. Eric O. Lindsey, University of New Mexico, for providing the International Terrestrial Reference Frame (ITRF) transformation code and for a fruitful discussion on geodesy work along the Himalaya. I am highly obliged to Prof. Teruyuki Kato, (Hot Springs Research Institute of Kanagawa Prefecture, Japan), Prof. Roland Burgmann (University of California, Berkeley), Prof. John B. Rundle (University of California, Davis), Dr. Konstantinos G. Chousianitis (National Observatory of Athens, Greece) for their valuable comments and suggestions on our research papers. I extend my thanks to Prof. Onkar Dikshit (Indian Institute of Technology Kanpur, India), Prof. Javed N. Malik (Indian Institute of Technology Kanpur, India), Prof. Ruey-Juin Rau (National Cheng Kung University), Prof. Chung-Pai Chang (National Central University, Taiwan), and Prof. Jiun-Yee Yen (National Dong Hwa University, Taiwan) for their time-to-time support and guidance.

I wish to thank my wife Nikita, my junior Neha, and my friend Ankit Saini for helping and accompanying me in campaign GPS data collection in the northwest Himalaya. I would also like to thank my brother Pankaj Sharma, my wife Nikita, and my juniors Neha and Himanshu for helping me to find out technical errors in the thesis draft. Last but not the least, I am grateful to my batchmate-cum-friend Ankit Kumar for standing with me in each and every good or bad situation during this journey.

I thankfully acknowledge the Council of Scientific and Industrial Research Human Resource Development Group (CSIR HRDG), India for providing me financial assistance as Junior and Senior Research Fellowships during my tenure at BITS Pilani as a Ph.D. research scholar. I acknowledge Integrated Research on Disaster Risk, International Center of Excellence (IRDR ICoE) and International Science Council Regional Office for Asia and the Pacific (ISC ROAP), Taiwan for providing the seed grant under the project "Contemporary Earthquake Potential Analysis along the Central and Nepal Himalaya".

Place: BITS Pilani Yogendra Sharma
Date: February 02, 2021 (Department of Mathematics)