Acknowledgements

Obtaining a PhD has long been a dream of mine. This dream could not have come to fruition without the support of many of my well-wishers to whom I shall remain eternally grateful. Here, I would like to acknowledge their invaluable support in aiding this achievement.

I wish to incorporate $Sahadharmin\bar{\imath}$ (companion soul) and Bandhu-Mithradhikal (relatives and friends) into the classical quartet of support pillars — Matah (mother), Pitah (father), Guru (teacher), Deivam (God) — commonly attributed as reasons for one's success in ancient Indian scriptures such as the Vedas, Shastras, Charitras, Itihasas and Purāṇas. Whilst making this personal amendment, I would like to de-emphasise any connotations of hierarchy amongst these support pillars, since they all play equally important roles in one's life.

During these four years, the level of support accorded by my wife Parvathy Chittur Subramanian prasad cannot be described in mere words. She voluntarily shouldered all matters of responsibility in the family so that I could focus solely on my research. At this prime of her youth, she has sacrificed so many material comforts and happily lived a relatively austere life by humbly accepting the financial constraints that are part and parcel of a student's life. In the same vein, I owe a lot to my parents Shri Gopalakrishnan P. K. and Smt. Ananthalakshmi G. It has been ten long years since I departed Indian shores in pursuit of higher studies. During all those years, despite ill-health and missing my presence at home, they have always urged me to carry on and complete my studies. Many a time, I have experienced a hopeless sense of incompleteness due to my inability to fulfil the basic duties of a son towards his parents, the least of which is spending quality time with them. However, my parents have always brushed aside their physical and financial difficulties to put my success above everything else.

It is needless to explain the crucial role of academic supervisors in the life of a doctoral candidate. I was extremely lucky to be bestowed with not just one, but two amazing supervisors here at Imperial College London — Dr Gregory J. Offer and Dr Monica Marinescu. I have immensely benefited from their supervision, both from technical and personal perspectives. Even during moments of sheer despair, my supervisors steadfastly held faith in my abilities. Their unflinching support contributed in no small measure for this success of mine. I also wish to acknowledge Dr Davide M. Raimondo who served as my unofficial supervisor and allocated months of his personal time for my research, often well outside regular working hours. I also wish to express my gratitude to Dr Gregory L. Plett who has always generously offered his technical expertise and guidance on all my research ideas. I am thankful to Dr Teng Zhang who mentored me in my initial days here and without his feedback, I could not have published my first journal article.

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