Preface

During the years in which the research results compiled in this monograph were obtained, many people contributed directly or indirectly to these results. There is, first of all, the head of our research group "Numerics, Dynamics and Optimization", Peter E. Kloeden. I want to thank him not only for his support and his scientific interest in this work, but also for the pleasant working atmosphere and for leaving me so much time for the realization of my own research. Many thanks also go to all the other members of the group and of the Fachbereich Mathematik of the J.W. Goethe–Universität, especially to Helga Ambach for her help with all the common problems in daily university life and to Peter Bauer for keeping my computer running.

A big "grazie" goes to all the members of the Dipartimento di Matematica "Guido Castelnuovo" of the Università di Roma "La Sapienza", who made my one–year visit not only scientifically successful. In particular, I am grateful to Maurizio Falcone for his great hospitality and all the things he did for us during this year. I would also like to thank Martino Bardi for the possibility to enjoy the stimulating atmosphere of the Dipartimento di Matematica Pura ed Applicata of the Università di Padova during my one–month visit.

Special thanks go to Fritz Colonius, Eduardo Sontag and Fabian Wirth for taking great interest in my research and providing me with lots of suggestions, remarks and comments which considerably helped to improve this book. I am also grateful to Albert Marquardt and Christine Schweinem, who proofread parts of this manuscript. Finally, I would like to thank all the other people who in numerous ways helped me to understand one or the other aspect of the behavior of perturbed and discretized systems and thus contributed to the results that can now be found in this monograph, as there are Fabio Camilli, Roberto Ferretti, Gerhard Häckl, Oliver Junge, Christopher Kellett, Viktor Kozyakin, Laurent Praly, Ludovic Rifford, Udo Schmidt, Pierpaolo Soravia, Dietmar Szolnoki and Andrew Teel. I apologize to all those people who are missing in this list although their names should have been included.

This book would have been impossible without the results of several fruitful collaborations. In particular, this concerns the construction of high–order numerical schemes for systems with affine input in Section 5.2, which were developed in collaboration with Peter Kloeden (see also [55]), and the gener-

alization of Zubov's method to systems with input in Section 7.2, which was investigated together with Fabio Camilli and Fabian Wirth, cf. also [15, 16, 17, 58].

These collaborations and the invaluable exchanges with other people was only made possible by the constant funding of several organizations, research programs and networks. First of all I would like to thank the Deutsche Forschungsgemeinschaft (DFG), which not only supported several trips to international conferences but in particular funded the one year visit at the Università di Roma "La Sapienza". The participation at a number of conferences would not have been possible without the support of the Hermann Willkomm–Stiftung of the J.W. Goethe–Universität. Last but not least, I would like to express my special thanks to the European Union's TMR network "Nonlinear Control Network", to the groups in Rome and Padua of the TMR network "Viscosity Solutions and their Applications" and to the DFG priority research program "Ergodentheorie, Analysis und effiziente Simulation dynamischer Systeme (DANSE)", as well as to their respective coordinators Françoise Lamnabhi–Lagarrigue, Italo Capuzzo Dolcetta, Martino Bardi and Bernold Fiedler. The numerous workshops and conferences within these programs as well as the generous funding of visits and guests have considerably contributed to the research which is documented in this monograph.

Finally, and most importantly, I want to thank Brigitte Grüne for her constant support and understanding, which helped me in many ways. I dedicate this work to her.

Frankfurt am Main, October 2001 Lars Grüne