Hybrid Systems for N-body Simulations

Spinnato, P.F.

Citation for published version (APA):

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: https://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.
Acknowledgments

It is with some degree of concern that I begin to write these acknowledgments, since I'm aware of the fact that this will be the first (and maybe the only) part of this dissertation that people will read. For this reason, I was tempted to put the entire text of the thesis under this section. This would have allowed me to break the world record for the longest acknowledgments ever, but it would have also induced the opposite effect, i.e., decreasing dramatically the number of my readers. Anyway, let's stop beating about the bush (sooner or later, it comes time for bushes to be beaten), and come to the point.

First of all, I'd like to thank Peter Sloot, my supervisor, for involving me in an exciting research field, at the crossroads of Algorithmics, Astrophysics, and Computer Science. The direction taken by my research owes much to his supervision. I'm also grateful to him for having involved me in teaching and refereeing activities. It was very stimulating and instructive to be an assistant in various courses, and also to serve as a referee for scientific journals and conferences where Peter occupies a steering role.

My thanks also go to Dick van Albada, my co-supervisor. His care for precision and rigorous attention to details influenced not only the research results, but also the final shape of this dissertation, which owes a great deal to his scrutinious reading of my drafts. I'm indebted to him and his family for their hospitality during my first days in the Netherlands.

I spent most of the last year and a half of my Ph.D. working with Simon Portegies Zwart. It has been a very enjoyable and fruitful collaboration, which resulted in the work presented in chapter 5 of this thesis. His enthusiasm and exuberance has always made it a pleasure to work with him; his inexhaustible energy has made it almost an ordeal! I also enjoyed helping him with the Stochastic Simulation 2003 course; our challenge of solving the Travelling Salesman Problem faster is still open. I'm sure my treecode solver will beat his Monte-Carlo one!

I gratefully acknowledge Ed van den Heuvel for having provided the funding that supported the last six months of my Ph.D.

I thank the members of my Ph.D. committee for agreeing to read my dissertation, and
Acknowledgments

I'm grateful to Jun Makino from the University of Tokyo for having provided the two GRAPE-4 boards that I used for my performance analysis work, and the ASCI for the availability of the DAS cluster at the University of Amsterdam, where the GRAPE boards were attached. I used the DAS extensively for my performance analysis work presented in chapter 2. Thanks to ASCI also for the availability of the new DAS-2 system, that was used to carry out part of the simulations upon which chapter 5 is based.

I'm grateful to Vittorio Rosato from the HPCN group of ENEA for his invitation, which resulted in a very instructive visit to the ENEA centre at Casaccia. There, I was introduced to the APE system, and had the chance to meet the members of the HPCN group, who I was very pleased to see again a few months later at the SIMAI conference in Ischia. During that visit, I also met Roberto Capuzzo Dolcetta from the University of Rome, who I'd also like to acknowledge for his activities towards strengthening and expanding the role of Computational Astrophysics in Italy.

I'm indebted to Michael Sipior for proofreading chapter 1 and part III of this dissertation during a joint train trip to Antwerp and back. His corrections were my only achievement of that day, for our great expectations of what brought us to Antwerp were completely frustrated. And, I'm afraid that Michael's work was also in vain, as the modifications that I introduced subsequently certainly spoiled Michael's efforts to de-italianise my English. I'm also profoundly grateful to Roeland Merks, who accepted, and heroically fulfilled the duty of amending my creative Dutch, and rendered the "samenvatting" of this thesis a decent piece of text. My reckless offer of compensating his efforts with a beer for each mistake he would find could have bankrupted me if Roeland had really counted them. I could have done better if I had bought an entire brewery for him! Roeland even raised the bid: he said he would buy a drink for each mistake he left in the "samenvatting". The error-hunting is still open! I'm also grateful to Amy Soller for revising the text of these acknowledgments, and Juan Heguiahere for his prompt and remote help in obtaining the ISBN number of this book.

I'd like to acknowledge Marteen de Rijke for writing the ILLC dissertation style \LaTeX{} package, which I used for this thesis, Roeland Merks (too many acknowledgements for you, Roeland!!) for providing me with his modified version of the bibliography style package used here, Rosella Gennari for the countless number of times when she helped me with \LaTeX{} related problems, always reproving me for my troglodytic use of software tools. I express my gratitude to the great community of \TeX{} and \LaTeX{} developers for their contributions in constantly enhancing this formidable typesetting system, and to the initiator of this enterprise, Donald Knuth, for his love of beauty and elegance.

A dissertation is a place where scientific results of a Ph.D. are collected, hence emotional feelings are better kept out of it. My gratitude for the friendship and availability that my colleagues of the SCS group, the Institute for Informatics, the secretariat personnel, and my friends in Amsterdam and elsewhere showed me won't be acknowledged here, but personally to each of them.

Since I graduated in 1995 in Palermo, I stayed in different places around Europe, met
many interesting people, and got in touch with different cultures. Man’s real home is not a house, but the Road, and life itself is a journey to be walked on foot, said Chatwin, and this could also be my motto. Meeting my travel mate for this journey was the greatest achievement of my stay in Amsterdam.

Piero Spinnato

Trento, 5th August 2003

PS The cover image is inspired by Phaedrus’ De vulpe et uva:

\begin{quotation}
Fame coacta vulpes alta in vinea
Uvam appetebat summis saliens viribus;
Quam tangere ut non potuit, discedens ait:
‘Nondum matura est; nolo acerbam sumere’.
Qui, facere quae non possunt verbis elevant,
Adscribere hoc deebunt exemplum sibi.
\end{quotation}

Guessing the metaphor that connects the above fable to this thesis is left as an exercise to the reader.