

Preface

Welcome to the exciting and important field of *dynamic systems*! Mastering the theory of dynamic systems enables you to analyze and design dynamic systems of various kinds, in particular control systems and signal processing systems.

This book can be used as a text book in B.Sc. and M.Sc. studies in engineering. It assumes that you have basic knowledge about complex numbers, differential equations, the Laplace transform, and linear algebra. Appendices in the book gives an introduction to these topics.

The book describes the theory, but does not (except in a few cases) describe computer tools for analysis and design. However, lots of supplementary material are available from the home page of the book at <http://techteach.no>. This material is in the form of documents which describes how analysis, simulation, and design of dynamic systems can be performed in MATLAB, Octave¹, SIMULINK, and LabVIEW. From this home page there is also a link to KYBSIM (<http://techteach.no/kybsim>) which is a library of freely available simulators. Many of these simulators are used in this text book.

I have tried to describe the material in a simple and understandable way. I will appreciate suggestions and comments about both the presentation in the book and the choice of topics (e-mail to finn@techteach.no).

The book is written with the text formatting programme Scientific Workplace. LabVIEW, MATLAB, and SIMULINK are used as computer-based tools for analysis and simulation. Most simulations are performed with LabVIEW.

The present edition is a preliminary edition of the book. The official first

¹Octave is a free mathematical tool, quite similar to MATLAB, with lots of in-built function categories, like the toolboxes in MATLAB. Octave is available from <http://www.octave.org>.

edition will be available in July 2004.

An exercise book with solutions will be available during Spring 2004 (information will be given on <http://techteach.no>).

A few words about my background: I have a M.Sc. degree (1985) in Engineering cybernetics from the Norwegian Institute of Technology. I have been doing teaching, writing, programming, and consulting since then. I have now a teaching position at the Telemark University College. I also work through my one-man company TechTeach.

I want to thank my family for giving me good working conditions while writing this book.

FinnHaugen

Skien, Norway, January 2004