science and engineering on a scale not seen since the Apollo project. Is this a nostalgic view or is the present focus on the immediate financial return itself short-lived?

There can be no one disputing that technical maturity is the key to use. What is less clear is how to fund the technological risk-reduction that is needed. During the Cold War the military did that but now we are to hope for the market. Multiple studies are done all indicating some advantages over the current but never produced due to lack of return on investment. One new consideration is impact on our environment and here hybrids (at least with nonmetallic fuels) are significantly better than solids and similar to liquid. *'Hence hybrids could become the boosters of choice in the 21st Century for a large fraction of the worlds space launchers*' (page 632).

With benefits also claimed for satellite operations, especially deorbiting propulsion and sub-orbital passenger flights, a general knowledge of hybrid propulsion will be essential for the future space consultant. In fact, any one asked to comment on new ventures will find this volume both a source of knowledge and a starting point for research. Finally, a space tourism investor should read the first chapter at least, before investing.

Anders Hansson

Stability and Control of Aircraft Systems: Introduction to Classical Feedback Control

R. Langton

John Wiley and Sons, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ. 2006. 238pp. Illustrated. £65. ISBN 0-470-01891-7.

The author's objective is to write a textbook to answer the question '*What would have been most useful to me as a prospective systems engineer in the pre-to-post graduate timeframe seeking guidance and insight into the fundamentals of feedback control?*' The author achieves this admirably and compresses into just over 200 pages the material of a complete undergraduate final year option. The treatment has not changed in the last 50 years except that this reviewer then had a bookshelf of text books in support of this subject – many by this publisher. Now the subject of classical feedback control is all in this one book.

The first chapter provides a reminder of the terminology associated with control theory and is a fast revision of engineering maths. It leads to the next two chapters targeted at frequency response techniques. Chapter 2 speeds through the use of Bode and Nyquist Diagrams to Nichols Charts. Chapter 3 takes the understanding and diagrammatic techniques of the previous chapter to show how to build compensation transfer function components.

Chapter 4 then takes an alternative insight into the system equations using Laplace Transforms to study the transient response of the system. These are used to introduce the root locus design technique. This is an altogether more complicated method of presentation and a reader who is weak in maths may well get put off. Those who are just rusty will find it all come flooding back.

Up to now the book has dealt with equations for linear system. Chapter 5 introduces methods of dealing with nonlinearities such as deadspace and friction. This chapter is particularly well presented and hits all the right buttons. In particular it spends time showing how describing functions for such nonlinearities as hysteresis can be used on the Nichols chart to relate the effect to the linear system being controlled.

The digital computer as the control element is considered in Chapter 6. Simple architectural concepts are presented together with the impact on closed loop stability caused by the time delays associated with the computing function.

Disappointingly the book does not explore the equations of motion of an aircraft and present the perturbation equations with a discussion on how the various coefficients effect the frequency response, transient response and movement of root loci. However the book's title refers to the *Stability and Control of Aircraft Systems* and not to the stability and control of aircraft. Inclusion of this topic would have made the book of much more interest to the aerospace community especially as this is where all the techniques presented in this book come together into one coherent process.

The techniques as presented in the book are not actually aerospace specific and the examples only relate to components such as actuators. Thus the book is equally applicable to any one starting as a control engineer in any industry. Armed with the details in this book a new practitioner could enter any control laboratory and be effective.

Eur Ing M.A. Stanberry, MRAeS

Basic MATLAB, Simulink and Stateflow

R. Colgren

American Institute of Aeronautics and Astronautics, 1801 Alexander Bell Drive, Suite 500, Reston, VA 20191-4344, USA. 2007. 485pp. Illustrated. $64.95 (AIAA Members), $94.95 (Non-Members). ISBN 1-56347-838-2.

The book offers a set of hands-on exercises to the usage of Matlab, Simulink and Stateflow computer programmes in scientific and engineering problems and therefore can be considered as an addition to any engineering and science course.

Matlab, Simulink and Stateflow are excellent high-level software tools for the simulation, analysis, and implementation of dynamic systems. The book covers major features of these programmes in fourteen chapters organised in a clear manner. The introductory chapter describes the basic Matlab and gives some hints how to use online documentation. Successive chapters introduce the plotting and graphics tools, toolboxes and structures, M-files and MEX–files and the interface development environment available in Matlab. The next chapters provide the readers with examples how to build Simulink models and the final chapter introduces the Stateflow graphical modelling capabilities.

The material is well organised and allows the reader to progress from the basic to more advanced concepts and therefore can be used as a part of teaching courses or as a self-study material while working independently. It is always recommended to learn by doing and therefore this book enhances the learning experience via the exercises to go through. These are supported by figures of screen displays. The approach taken in this book is practical and does not require any previous experience or knowledge of Matlab, Simulink or Sateflow. However the book does not offer detailed coverage of these packages and may seem of little value to the reader expecting a comprehensive introduction to Matlab, Simulink or Stateflow. The book emphasis is on demonstrating the strength of Matlab, Simulink and Stateflow procedures, covering specific features related to organisation of data types, variables, operators and functions. It may be considered as a quick reference guide to frequently used Matlab, Simulink and Stateflow commands. The book, if used as a textbook for courses in science and engineering, should be supplemented by guidance to the programming principles and algorithm development.

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