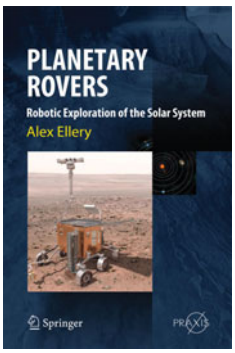


Planetary Rovers: Robotic Exploration of the Solar System

A. Ellery

Springer. 2016. 702pp. Illustrated. £117.
ISBN 978-3-642-03258-5.

This is a comprehensive textbook, weighing in at over 700 pages, complete with over 1,500 references and an appendix on Bayesian methods. It aims to be a complete overview of the design, implementation and control of planetary rovers, ranging widely from details of past rovers, through overviews of algorithm research into the process of bidding and managing projects for the European Space Agency (ESA).

As such, it targets a wide audience from final year undergraduates to industry engineers involved with rover development – anyone involved in rover design. The wide audience means that in places there is an excess of detail for a familiar reader, and yet in less familiar topics the attempt to cover so much can lead to coverage seeming brief – the author has a fine line to tread. The text is used at its best as a reference – it is certain to provide a good introductory overview of any given area of rover design, covering the key concepts and providing references to jump off into deeper study. It would provide an introduction to the field as a whole, or supporting knowledge of other rover subsystems to a domain expert.

Although the breadth, and thus length, of this book is a strength, it could easily be shortened with further editing. Information is often repeated, and in places it is over long – describing, for example, specifications of rovers in text where a comparative table would be more concise and more readable. There are also numerous missing references, comparisons in mis-matched units and other small errors that one would hope to see resolved in any subsequent editions. However, problems are less obvious and easily overlooked when consulting sections as a reference.

The initial chapters provide some keen observations on the context in which rover exploration sits, providing a nice introduction into planetary geology motivating the need for robotic exploration and the design choices necessary.

The chapters then proceed in a bottom-up manner through all parts of a rover system. This starts with the mechanical design of the rover – focusing on platform mobility – before moving onto the low-level control systems in Chapter 5. These chapters are particularly strong, both informing the reader of the main issues as well as introducing the necessary mathematics to model and solve some of the design issues.

The next chapters cover vision systems, navigation and path planning. Again, coverage is broad – though it does throughout

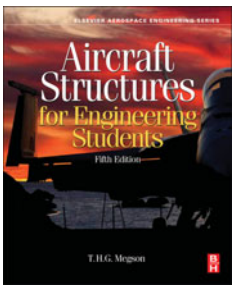
https://doi.org/10.1017/aer.2016.136 Published online by Cambridge University Press

dip into the mathematical underpinnings. Here, especially when describing vision algorithms, more diagrams would be helpful to support the maths. Perhaps the space would be better spent with diagrams to provide intuition into the algorithms rather than exact details – for anyone implementing a vision system this would just be a starting point after all. The final chapters cover the higher-level functionality built on top of a rover system with sample acquisition followed by on-board science autonomy.

As most chapters take the form of literature review style summaries of existing work with excursions into the salient mathematical models or algorithms, it is useful to consider the timeliness of the review. The chapters vary in their recency, such a large work clearly covers several years. The introduction refers to the recent landing of Chang'e-3 on the Moon, an event that occurred late 2013; however, some chapters have information from 2011 presented as recent. It is by no means out of date, however, when considered as an overview reference text rather than state-of-the-art research.

To conclude, I would recommend this book to anyone working or interested in the field requiring a reference to all parts of a rover system. Whilst verbose in places, this is not a significant hindrance dipping in to a chapter, and you are rewarded with a good literature-review style overview with samples of key intuitions and underlying mathematics.

Dr Iain Wallace



Aircraft Structures for Engineering Students – Fifth edition

T. H. G. Megson

Elsevier Butterworth-Heinemann, The Boulevard, Langford Lane, Kidlington, Oxford, OX5 1GB, UK. 2013. 859pp. Illustrated. £49.99. ISBN 978-0-08-096905-3.

When first published by Edward Arnold in 1972, all aspects of the undergraduate course were fully covered in 13 chapters and 485 pages. This fifth edition of 28 chapters and 859 pages is still presented in two parts: 'Fundamentals of Structural Analysis 'and 'Analysis of Aircraft Structures', the main body of text having changed but little over the years. Noted additions include 6 pages on rivet joints, a few more on composite structures and a few more on crack propagation, plus 28 pages devoted to a mini design study. Many new worked examples and exercises including MATLAB demonstrations have also been added.

Chapter 1, 'Basic Elasticity', introduces 3D stress notation, equilibrium and the concept of stress at a point, followed by 2D topics, such as plane stress, stresses on

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