

Book Reviews

Small Unmanned Aircraft: Theory and Practice

**R. W. Beard and
T. W. McLain**

Princeton University Press, 6 Oxford Street, Woodstock, OX20 1TW, UK. 2012. 300pp. Illustrated. £69.95. ISBN 978-0-691-14921-9.

Unmanned aircraft systems (UAS) are no doubt playing an important and increasing role in both civil and military sectors. As demonstrated recently, applications of UAS can be diverse – ranging from military missions such as reconnaissance, surveillance, battlefield damage assessment, communication relays, to civil use in environmental monitoring, fire monitoring, border patrol, aerial mapping, traffic monitoring, precision agriculture, disaster relief, rural search and rescue, as pointed out in the book reviewed authored by Beard and McLain.

In Beard and McLain's book they choose small unmanned aircraft as their main subject. These small unmanned aircraft are typically gas powered, operate on the order of 10 to 12 hours, with wingspan between 5 and 10 feet and payload of approximately 10 to 50 pounds. However, many concepts described in their book should also apply to battery powered fixed-wing micro air vehicles (MAVs) with wingspans less than 5ft.

As an introductory level book, it can be a good choice in understanding the basic challenges in guiding and controlling limited-payload small and miniature aircraft systems. The 13 chapters of the book start from an introductory chapter while the rest cover most of the issues relevant to control and guide MAVs, including co-ordinate frames, kinematics and dynamics, forces and moments, design models for control, autopilot

design, sensors for MAVs, state estimation, design models for guidance, line and orbit following, path manager, path planning and vision-guided navigation.

This book is specifically designed for students and beginners with good background knowledge on engineering. It is a good reference book as well, covering many key concepts of MAVs. To engage readers' involvement, this book has an associated design project which has been carefully divided into steps and attached to the end of each chapter. Readers can implement these concepts in Matlab/Simulink to gain further understanding of these concepts and challenges.

Professor Shigang Yue, University of Lincoln

Theory of Lift: Introductory Computational Aerodynamics in MATLAB/ Octave

G. D. McBain

John Wiley and Sons, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK. 2012. 317pp. Illustrated. £64.95. ISBN 978-1-119-95228-2.

Of the many books on the theory of aerodynamics, why would a reader pick up this one? Almost certainly the mention of MATLAB® and (GNU) Octave will be a factor. Increasingly these high level mathematical programs are being used for their easy handling of arrays and complex numbers. The concept is most welcome, but does it live up to expectations?

The motivation for the book is clearer from the Preface than from the publisher's