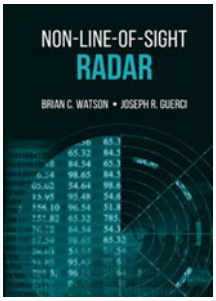
pp 2019–2067.
doi:10.1017/aer.2020.97

Book Reviews



Non-Line-of-Sight Radar

B. C. Watson and J. R. Guerci

Artech House, 16 Sussex Street, London SW1V 4RW, UK. 2019. 215 pp. Illustrated. £130. (20% discount available to RAeS members via www.artechhouse.com using RAE2020 promotion code) ISBN 978-1-63081-531-8.

Methods to process returns from surveillance and tracking radars have been well developed. The assumption is usually made that there is a direct line of sight to the targets of interest, in addition to possible reflections.

Recently, there has been interest in tracking targets using radar when there may be no direct line of sight, for example in an urban environment where there are multiple reflections off buildings. This book describes the developments that have been made in this new area.

The book initially covers topics such as Moving Target Indication (MTI) radar, Kalman filters, nonlinear estimation, multi-hypothesis tracking and particle filters. Subsequent chapters cover the important topics of physically modelling the environment around the radar, looking at the electromagnetic field in the presence of buildings and modelling the radar's antenna pattern. An example is given of tracking a car in three different urban environments.

The authors discuss the use of extracting information from various databases, such as Google Earth and Google Street View, in modelling the environment, and in fact a significant part of the book discusses how one can import information on buildings and terrain into simulation packages. Ray-tracing methods are described in some detail. The final chapter discusses the potential use of Global Positioning Units (GPUs) and Field-Programmable Gate Arrays (FPGAs) in carrying out real-time Non-Line-of-Sight (NLOS) tracking.

Overall, the book is well written. The target audience are engineers and scientists who are already familiar with radar and are interested in the NLOS situation. The authors succeed in providing enough theory to provide an understanding of the various techniques that are used, without it becoming too dense and dry. Topics such as electromagnetic field equations and Kalman filters are given with sufficient references to help those who may be unfamiliar with the material.

My only criticism concerns the quality of some diagrams, which are too small to convey any useful information. The diagrams are all grayscale, and sometimes curves and data points are given in various shades of grey, which makes them difficult to distinguish. In some cases, the authors point out features in diagrams that are very difficult to see. It would be beneficial if in future editions these diagrams were either expanded or reproduced in colour.

Overall, this is a worthwhile book on NLOS radar, and it is hoped that future editions will be produced as this interesting field of work develops.

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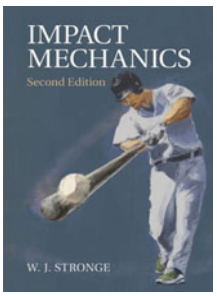

Impact Mechanics – second edition

W. J. Stronge

Cambridge University Press, University Printing House, Shaftesbury Road, Cambridge CB2 8BS, UK. 2018. xx; 362 pp. Illustrated. £120. ISBN 978-0-521-84188-7.

The present book *Impact Mechanics* provides an excellent theoretical foundation for engineering students and industrialists dealing with impact problems. This is the second edition of the book, which mainly focuses on non-penetrating collisions. In the first chapter, collisions are categorised into four groups based on the method of analysis, including particle impact, rigid-body impact and transverse and axial impacts on flexible bodies. The assumptions behind each method of analysis and the applicability of each method in solving low-speed impact problems are clearly explained. This is a useful introductory chapter and is especially beneficial to students with little or no background in this subject.

The subsequent four chapters are dedicated to rigid-body impact analysis.

https://doi.org/10.1017/aer.2020.97 Published online by Cambridge University Press