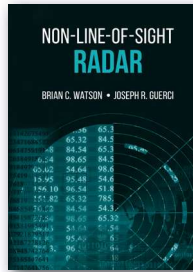


Book Reviews



Non-Line-of-Sight Radar

**B. C. Watson and
J. R. Guerici**

Artech House, 16 Sussex Street, London SW1V 4RW, UK. 2019. 215pp. 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 site to the targets of interest, in addition to possible reflections.

Recently, there has been an interest in tracking targets using radar when there may be no direct line of site, 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 MTI (moving target indication) 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 also 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 GPUs (global positioning units) and FPGAs (Field Programmable Gate Arrays) in carrying out real-time NLOS (non-line-of-sight) 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 in order to provide an understanding of the various techniques that are used, without it being 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 make 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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