



# Introduction to Sensors for Ranging and Imaging (Electromagnetics and Radar)

*By Graham Brooker*

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## **Introduction to Sensors for Ranging and Imaging (Electromagnetics and Radar)** By Graham Brooker

This is a comprehensive textbook and reference that provides a solid background in active sensing technology. Beginning with a historical overview and an introductory section on signal generation, filtering and modulation, it follows with a section on radiometry (infrared and microwave) as a background to the active sensing process. The core of the book is concerned with active sensing, starting with the basics of time-of-flight sensors (operational principles, components), and goes through the derivation of the radar range equation, and the detection of echo signals, both fundamental to the understanding of radar, sonar and lidar imaging. Several chapters cover signal propagation of both electromagnetic and acoustic energy, target characteristics, stealth and clutter. The remainder of the book involves the basics of the range measurement process, active imaging with an emphasis on noise and linear frequency modulation techniques, Doppler processing, and target tracking.

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