

Introduction to Radar

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The tutorial covers the basic principles of radar, for a wide range of different applications. It is based on an MSc module taught for many years at University College London, but with strong influence from the 'Stimson's Introduction to Airborne Radar (3rd edition)' book. In that sense the style of the tutorial is to attempt to explain concepts pictorially rather than by pages of mathematics.

The tutorial will be suitable for PhD students, and also for practitioners in industry who require an introduction or a 'refresher' to the subject. It would also serve as an introduction to some of the other tutorials, covering topics at a basic level and introducing the appropriate concepts and terminology.

The course is made up of twelve topics reflecting the important concepts in modern radar. These concepts will be illustrated with examples from practical modern radar systems

1. Historical background, basics
2. The radar equation
3. Noise, clutter and detection
4. Doppler Radar and MTI
5. Pulse compression and waveform design
6. FM radar
7. Synthetic Aperture Radar
8. Tracking radar, monopulse
9. Phased array radar
10. Stealth and counterstealth
11. Bistatic radar
12. Examples of radar systems

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Hugh Griffiths holds the THALES/Royal Academy of Engineering Chair of RF Sensors at University College London. From 2006-2008 he served as Principal of the Defence College of Management and Technology (DCMT) at the Defence Academy of the United Kingdom, Shrivenham. He received the MA degree in Physics from Oxford University, and the PhD and DSc(Eng) degrees from the University of London. His research interests cover radar, antennas, and signal processing, and he has published over 600 papers, technical articles and books on these subjects.

He served as President of IEEE AES in 2012/2013. He has won a number of awards, including the IEEE AES Nathanson Award (1986), the IET A F Harvey Prize (2013), and the IEEE Picard Medal (2017). Since 2017 he has served as Chair of the Defence Science Expert Committee (DSEC) in the UK Ministry of Defence. He was appointed OBE in 2019 for services to engineering, and he was elected Fellow of the Royal Society in 2021.