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Titolo	Purchase of land for Camp Marfa, Tex. January 10, 1927. -- Committed to the Committee of the Whole House on the State of the Union and ordered to be printed
Pubbl/distr/stampa	[Washington, D.C.] : , : [U.S. Government Printing Office], , 1927
Descrizione fisica	1 online resource (2 pages)
Collana	House report / 69th Congress, 2nd session. House ; ; no. 1716 [United States congressional serial set] ; ; [serial no. 8688]
Altri autori (Persone)	WurzbachHarry McLeary <1874-1931> (Republican (TX))
Soggetti	Government purchasing of real property Military reservations Cost Legislative materials.
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Autore	Driggers Ronald G.
Titolo	Introduction to infrared and electro-optical systems / / Ronald G. Driggers, Melvin H. Friedman, and John W. Devitt
Pubbl/distr/stampa	Boston, MA : , : Artech House, , [2022] ©2022
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Lingua di pubblicazione	Inglese
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Intro -- Introduction to Infrared and Electro-Optical Systems Third Edition -- Contents -- Preface -- Acknowledgments -- Chapter 1 Introduction -- 1.1 Introduction to Imaging -- 1.2 Infrared and EO Systems -- 1.3 Wavelength Dependencies -- 1.4 Typical EO Scenario -- 1.5 Typical Infrared Scenario -- 1.6 Analytical Parameters -- 1.7 Sensitivity and Resolution -- 1.8 Linear Systems Approach -- 1.9 Summary -- 1.10 Guide to the References -- References -- Chapter 2 Mathematics -- 2.1 Complex Functions -- 2.2 Common One-Dimensional Functions -- 2.3 The 2-D Functions -- 2.4 Convolution and Correlation -- 2.5 The Fourier Transform -- 2.6 Fourier Transform Properties -- 2.7 Transform Pairs and Delta Function Properties -- 2.8 Probability -- 2.9 Important Examples -- 2.10 Guide to the References -- References -- Selected Bibliography -- Software -- Chapter 3 Linear Shift-Invariant Systems -- 3.1 Linear Systems -- 3.2 Shift Invariance -- 3.3 Basics of LSI Systems -- 3.4 Impulse Response -- 3.5 Transfer Function -- 3.6 System PSF and MTF Versus Component PSF and MTF -- 3.7 Spatial Sampling -- 3.8 Spatial Sampling and Resolution -- 3.9 Sampled Imaging Systems -- 3.10 Guide to the References -- References -- Selected Bilbiography -- Chapter 4 Diffraction -- 4.1 Electromagnetic Waves -- 4.2 Coherence -- 4.3 Fresnel and Fraunhofer Diffraction from an Aperture -- 4.3.1 Fresnel Diffraction -- 4.3.2

Fraunhofer Diffraction -- 4.4 Fraunhofer Diffraction from a Thin Lens -- 4.5 Thin Lens Optical System Diffraction PSF -- 4.6 Thin Lens Diffraction MTF -- 4.6.1 Modulation and MTF -- 4.6.2 Incoherent Diffraction MTF -- 4.6.3 Coherent Diffraction MTF -- 4.7 Calculation of Diffraction MTF -- 4.7.1 Circular Pupil: Coherent MTF -- 4.7.2 Circular Pupil: Incoherent MTF -- 4.8 Programs for Calculating Incoherent Diffraction MTF -- 4.9 Applications of Diffraction Theory.
4.9.1 Frequency Analysis of Optical Systems -- 4.9.2 Application to Geometric Optics -- 4.9.3 PSF of Distributed Aperture -- 4.9.4 Optical Image Processing -- 4.9.5 Stellar Interferometry -- 4.9.6 Apodization -- 4.9.7 Detector MTF from the Fraunhofer Diffraction Pattern -- 4.10 Light Goes Around Corners: The Poisson Spot -- References -- Chapter 5 Sources of Radiation -- 5.1 Radiometry and Photometry -- 5.1.1 Radiometric Units -- 5.1.2 Photometric Units -- 5.2 Infrared Targets and Backgrounds -- 5.2.1 Blackbody Radiation -- 5.2.2 Emissivity -- 5.2.3 Equivalent Differential Temperature (Delta T) -- 5.2.4 Apparent Differential Temperature (Apparent Delta T) -- 5.3 EO Targets and Backgrounds -- 5.3.1 External Sources -- 5.3.2 Contrast -- 5.4 Other Sensitivity Considerations -- 5.4.1 Bidirectional Reflectance Distribution Function -- 5.4.2 Color Considerations -- 5.5 Target and Background Spatial Characteristics -- 5.5.1 Bar Target Representation of Targets -- 5.5.2 Target Delta T and Characteristic Dimension -- 5.5.3 Summary of Target Characteristics -- 5.5.4 Clutter -- 5.5.5 Simulation of Target Characteristics -- 5.6 Typical Mid-Wave and Long-Wave Contrasts and Solar Effects -- References -- Selected Bibliography -- Chapter 6 Atmospherics -- 6.1 Atmospheric Components and Structure -- 6.2 Atmospheric Transmission -- 6.3 Absorption -- 6.4 Scattering -- 6.5 Path Radiance -- 6.6 Turbulence -- 6.7 Atmospheric Modulation Transfer Function -- 6.8 Models and Tools -- 6.9 Model Background Discussion -- 6.10 Some Practical Considerations -- References -- Chapter 7 Optics -- 7.1 Light Representation and the Optical Path Length -- 7.2 Reflection and Snell's Law of Refraction -- 7.3 The Thin Lens, Ray-Tracing Rules, and Gauss's Equation -- 7.4 Spherical Mirrors -- 7.5 Modeling the Thick Lens -- 7.6 Vergence -- 7.7 Multiple-Lens Systems -- 7.8 FOV.
7.9 Resolution -- 7.10 Aperture Stop, Pupils, and Rays -- 7.11 f-Number and Numerical Aperture -- 7.12 Telescopes and Angular Magnification -- 7.13 MTF -- 7.14 Aberrations -- 7.15 Optical Materials -- 7.16 Cold Stop and Cold Shield -- 7.17 A Typical Optical System -- 7.18 Diffraction Blur -- References -- Chapter 8 Detectors -- 8.1 Types of Detectors -- 8.1.1 Photon Detectors -- 8.1.2 Photoconductors -- 8.1.3 Photovoltaic -- 8.1.4 Photoemissive -- 8.1.5 Thermal Detectors -- 8.1.6 Bolometers -- 8.1.7 Pyroelectric Detectors -- 8.2 CCD and ROIC -- 8.2.1 CCD -- 8.2.2 Multiplexed Analog Readout -- 8.2.3 Column ADC ROIC or D-ROIC -- 8.3 Detector Sensitivity Analysis -- 8.3.1 Quantum Efficiency -- 8.3.2 Responsivity -- 8.3.3 Sensitivity -- 8.3.4 Detector Angular Subtense -- 8.3.5 FPA and Detector Noise (Including Detector 1/f Noise) -- 8.3.6 Dark Current and Rule'07 -- 8.3.7 1/f Noise -- 8.3.8 Photon Shot Noise -- 8.3.9 FPA and ROIC Noise (Including Fixed Pattern Noise) in Staring Systems -- 8.3.10 BLIP -- 8.4 EO Systems: Staring and Scanning Configurations -- 8.4.1 Raster Scan Systems -- 8.4.2 Linear Scan and TDI -- 8.4.3 Staring Systems: Focal Plane Arrays -- 8.5 Detector Transfer Functions -- 8.6 EO Detectors: Materials and Technology -- 8.6.1 MWIR and LWIR Photon Detectors -- 8.6.2 Far Infrared: VLWIR -- 8.6.3 Uncooled Bolometer -- 8.6.4 Visible and NIR -- 8.7 New and Emerging Infrared Detector Technology -- 8.7.1 Ultra-Large-Format Arrays and Small Pitch -- 8.7.2 Dual-Band Detectors (Third Generation)

Exploitation -- 14.12.11 Signal and Image Processing: Boost, Local Area Contrast Enhancement -- 14.12.12 Imaging Through Fog, High Humidity, Rain, Haze, Smoke, and Dust -- 14.12.13 Discussion -- 14.13 Small Detector Infrared Systems.
14.13.1 Small Detector Infrared System Fundamentals.

Sommario/riassunto

This newly revised and updated edition offers a current and complete introduction to the analysis and design of Electro-Optical (EO) imaging systems. The Third Edition provides numerous updates and several new chapters including those covering Pilotage, Infrared Search and Track, and Simplified Target Acquisition Model. The principles and components of the Linear Shift-Invariant (LSI) infrared and electro-optical systems are detailed in full and help you to combine this approach with calculus and domain transformations to achieve a successful imaging system analysis. Ultimately, the steps described in this book lead to results in quantitative characterizations of performance metrics such as modulation transfer functions, minimum resolvable temperature difference, minimum resolvable contrast, and probability of object discrimination.The book includes an introduction to two-dimensional functions and mathematics which can be used to describe image transfer characteristics and imaging system components. You also learn diffraction concepts of coherent and incoherent imaging systems which show you the fundamental limits of their performance. By using the evaluation procedures contained in this desktop reference, you become capable of predicting both sensor test and field performance and quantifying the effects of component variations. The book contains over 800 time-saving equations and includes numerous analyses and designs throughout. It also includes a reference link to special website prepared by the authors that augments the book in the classroom and serves as an additional resource for practicing engineers. With its comprehensive coverage and practical approach, this is a strong resource for engineers needing a bench reference for sensor and basic scenario performance calculations. Numerous analyses and designs are given throughout the text. It is also an excellent text for upper-level students with an interest in electronic imaging systems.

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