

1. Record Nr.	UNINA9910716483303321
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.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Batch processed record: Metadata reviewed, not verified. Some fields updated by batch processes. FDLP item number not assigned.

2. Record Nr.	UNINA9910808822603321
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
ISBN	1-63081-833-X
Edizione	[Third edition.]
Descrizione fisica	1 online resource (739 pages)
Disciplina	621.36
Soggetti	Electrooptical devices Electrooptics Infrared technology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
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

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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.

3. Record Nr.	UNISA996207460803316
Titolo	Office systems research journal
Pubbl/distr/stampa	[Cleveland, OH], : Office Systems Research Association, [©1982-©1999]
Descrizione fisica	1 online resource
Disciplina	651.8/4/05
Soggetti	Office practice - Automation Business - Data processing Periodicals.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Periodico
Note generali	Title from cover. "The journal of the Office Systems Research Association." Place of publication varies.