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Nota di contenuto	Spacecraft Sensors; Contents; Preface; 1 Introduction; 1.1 Concepts; 1.2 Spacecraft Sensors Cost; 1.2.1 Introduction to Cost Estimating; 1.2.2 Cost Data; 1.2.3 Cost Estimating Methodologies; 1.2.4 The Cost Estimating Relationship Method; 1.2.5 Insurance Cost; 1.3 Spacecraft Sensors Trade-off; 1.4 Spacecraft Environment; 1.4.1 Vacuum; 1.4.2 Neutral Environment Effects; 1.4.3 Plasma Environment Effects; 1.4.4 Radiation Environment Effects; 1.4.5 Contamination; 1.4.6 Synergistic Effects; 1.4.7 Space Junk; 1.5 Standards; 1.6 Packaging; 1.7 Interface and Integration; 1.7.1 Mil-STD 1553 Interface 1.7.2 Proximity Issues1.7.3 Integration; 1.8 Testing; 1.8.1 Performance Testing; 1.8.2 Thermal Testing; 1.8.3 Corona-arcing; 1.8.4 Electromagnetic Compatibility and Interference Testing; 1.8.5 Vibration Testing; 1.8.6 Balancing; 1.8.7 Mission Simulation Tests; 1.9 Sensors on Orbit; 1.9.1 Reference Frame; 1.9.2 Coordinate Transfer in Three-dimensional Space; 1.9.3 Conic Trajectories; 1.9.4 Attitude of a

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2.2.1 Signal Properties; 2.2.2 Periodic Signals; 2.2.3 Representing Signals as Impulses; 2.2.4 Random Signals; 2.3 Transforming a Signal; 2.3.1 Analog-to-digital Converter; 2.3.2 Digital-to-analog Converters; 2.3.3 ADC and DAC Errors; 2.3.4 Modulation; 2.4 Data Analysis; 2.4.1 Uncertainty Analysis and Propagation of Error; 2.4.2 Regression Analysis; 2.4.3 Least Square Method; 2.4.4 Fourier Analysis; Bibliography; 3 Noise and Filtering in Spacecraft Sensors; 3.1 Internal Noise; 3.1.1 Thermal Noise; 3.1.2 Thermal EMF; 3.1.3 Parameter Noise; 3.1.4 Dark Current; 3.1.5 Shot Noise
3.1.6 Excess Noise or $1/f$ Noise; 3.1.7 Dielectric Absorption; 3.2 External Noise; 3.2.1 Clutter Noise; 3.2.2 Jamming; 3.2.3 Radio Frequency Coupling; 3.2.4 Electromagnetic Field Coupling; 3.2.5 Inductive Coupling; 3.3 Signal-to-Noise Ratio; 3.4 Filter Types; 3.4.1 Low-pass Filter; 3.4.2 High-pass Filter; 3.4.3 Band-pass Filter; 3.5 Digital Filtering; 3.5.1 Window Design; 3.5.2 FIR Filter Design Example; 3.5.3 IIR Filter Design; 3.6 Microwave Filters; 3.7 Optical Filters; 3.8 Digital Image Filtering; 3.9 Kalman Filter; 3.9.1 State-space Representation; 3.9.2 Discrete Kalman Filter; Bibliography
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Sommario/riassunto

Spacecraft Sensors, the first of its kind, offers a comprehensive review of many aspects and intricacies of sensors used in the spacecraft industry. It covers sensor development from concept, design, and cost, to building, testing, interfacing, integrating, and on-orbit operation. It is intended for the specialist or non-specialist engineer, scientist, and those involved in the business aspect of the spacecraft industry. Focusing on how these various disciplines contribute to the development of a sensor used in space, this key text: Explains how mathematics, physics
