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Nota di contenuto	DYNAMICS OF SMARTSTRUCTURES; Contents; Preface; 1 From Smart Materials to Smart Structures; 1.1 Modern Materials: A Survey; 1.1.1 Polymers; 1.1.2 Structure and Classification of Polymers; 1.1.3 Characteristic Properties of Polymers; 1.1.4 Applications of Polymers; 1.2 Ceramics; 1.2.1 Properties of Ceramics; 1.2.2 Applications of Ceramics; 1.3 Composites; 1.3.1 Micro- and Macrocomposites; 1.3.2 Fibre-reinforced Composites; 1.3.3 Continuous-fibre Composites; 1.3.4 Short-fibre Composites; 1.3.5 Fibre-matrix Composites; 1.4 Introduction to Features of Smart Materials 1.4.1 Piezoelectric, Piezoresistive and Piezorestrictive 1.4.2 Electrostrictive, Magnetostrictive and Magneto-resistive; 1.4.3 The Shape Memory Effect; 1.4.4 Electro- and Magnetorheological Effects; 1.5 Survey of Smart Polymeric Materials; 1.5.1 Novel Inorganic Thin Film Materials; 1.5.2 Integrative Polymeric Microsystems; 1.5.3 Electroactive Polymers; 1.6 Shape Memory Materials; 1.6.1 Shape Memory Alloys; 1.6.2 Magnetically Activated Shape Memory Alloys; 1.6.3 Shape Memory Polymers; 1.7 Complex Fluids and Soft Materials; 1.7.1 Self-assembled Fluids; 1.7.2 Electro- and Magnetorheological Fluids 1.7.3 Smart Polyelectrolyte Gels 1.8 Active Fibre Composites; 1.9 Optical Fibres; 1.10 Smart Structures and Their Applications; 1.10.1 Medical

Devices; 1.10.2 Aerospace Applications; 1.10.3 Structural Health Monitoring; 2 Transducers for Smart Structures; 2.1 Introduction; 2.2 Transducers for Structural Control; 2.2.1 Resistive Transducers; 2.2.2 Inductive Transducers; 2.2.3 Capacitive Transducers; 2.2.4 Cantilever-type Mechanical Resonator Transducers; 2.2.5 Eddy Current Transducer; 2.2.6 Balancing Instruments; 2.2.7 Transduction Mechanisms in Materials
2.2.8 Hydrodynamic and Acoustic Transduction Mechanisms
2.2.9 Transducer Sensitivities, Scaling Laws for Example Devices; 2.2.10 Modelling and Analysis of a Piezoelectric Transducer; 2.3 Actuation of Flexible Structures; 2.3.1 Pre-stressed Piezoelectric Actuators; 2.3.2 Shape Memory Material-based Actuators; 2.4 Sensors for Flexible and Smart Structures; 2.4.1 Resonant Sensors; 2.4.2 Analysis of a Typical Resonant Sensor; 2.4.3 Piezoelectric Accelerometers; 2.4.4 The Sensing of Rotational Motion; 2.4.5 The Coriolis Angular Rate Sensor; 2.5 Fibre-optic Sensors
2.5.1 Fibre Optics: Basic Concepts
2.5.2 Physical Principles of Fibre-optic Transducers; 2.5.3 Optical Fibres; 2.5.4 Principles of Optical Measurements; 2.5.5 Fibre-optic Transducers for Structural Control; 3 Fundamentals of Structural Control; 3.1 Introduction; 3.2 Analysis of Control Systems in the Time Domain; 3.2.1 Introduction to Time Domain Methods; 3.2.2 Transformations of State Variables; 3.2.3 Solution of the State Equations; 3.2.4 State Space and Transfer Function Equivalence; 3.2.5 State Space Realizations of Transfer Functions; 3.3 Properties of Linear Systems
3.3.1 Stability, Eigenvalues and Eigenvectors

Sommario/riassunto

Dynamics of Smart Structures is a practical, concise and integrated text that provides an introduction to the fundamental principles of a field that has evolved over the recent years into an independent and identifiable subject area. Bringing together the concepts, techniques and systems associated with the dynamics and control of smart structures, it comprehensively reviews the differing smart materials that are employed in the development of the smart structures and covers several recent developments in the field of structural dynamics. Dynamics of Smart Structures has been d
