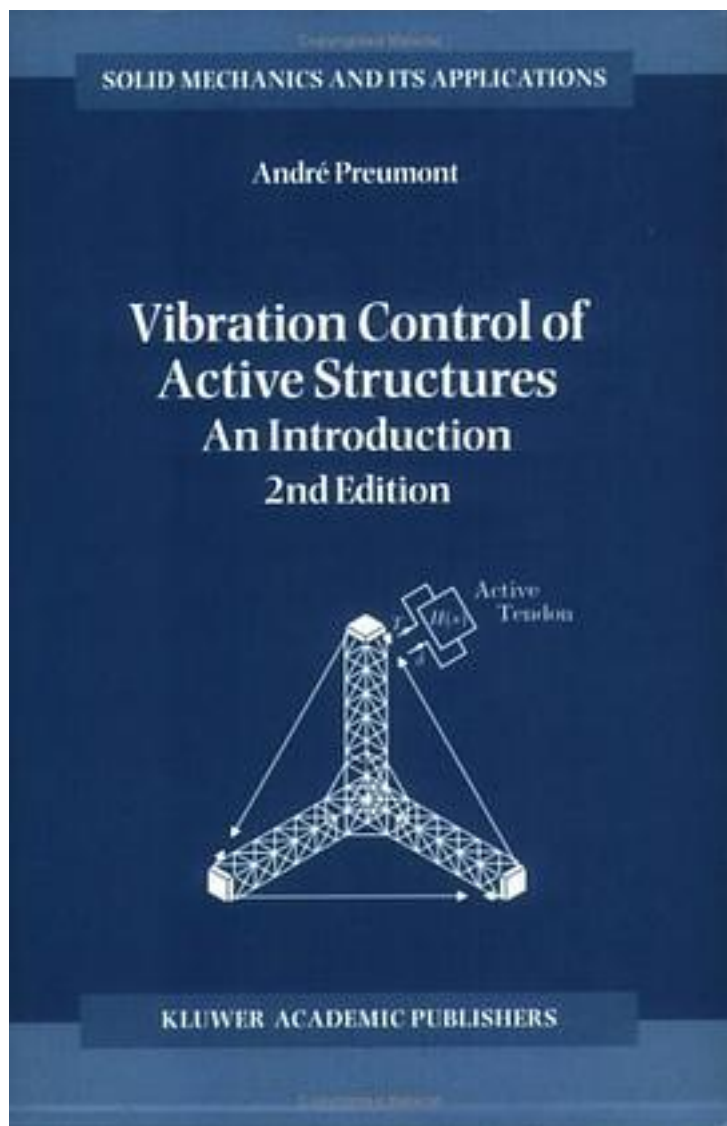


Vibration Control of Active Structures (Solid Mechanics and Its Applications)



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This book consists of 14 chapters. Chapters 2 and 3 are devoted to the dynamics of active structures; the open loop transfer functions are derived from the constitutive equations; the discussion includes active trusses with piezoelectric struts, and beams and shells with embedded laminar piezoelectric actuators and sensors. Chapters 4 and 5 discuss the virtues of collocated actuator/sensor configurations and how they can be exploited to develop active damping with guaranteed stability. Chapter 6 addresses vibration isolation for one and 6 d.o.f. Chapter 7 discusses optimal control for SISO systems with symmetric root locus. Chapter 8 discusses the design tradeoffs for SISO systems in the frequency domain, including the Bode amplitude/phase relationship. Chapter 9 provides a more general discussion of optimal control using of optimal control using the Riccati equation; spillover is examined. Chapters 10 and 11 review briefly the concepts of controllability, observability and stability. Chapter 12 discusses the semi-active control, including some materials on magneto-rheological fluids. Chapter 13 describes various practical applications to active damping, precision positioning and vibroacoustics, and chapter 14 discusses the active damping of cable-structures.

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