Research directions in distributed parameter systems

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Research Directions in Distributed Parameter Systems is composed of eleven chapters, written by experts in their respective fields, on topics ranging from control of the Navier-Stokes equations to nondestructive evaluation all of which are modeled by distributed parameters systems. Written by the plenary speakers for the Conference on Future Directions in Distributed Parameter Systems (October 2000), the volume addresses the state of the art, open questions, and important research directions in applications modeled by partial differential equations and delay systems, with the ultimate goal of passing along these perspectives to researchers in the field.

This book compiles a broad range of material, much of which is available only in research journals. Its goal is to disseminate to the research community the perspectives and challenges posed for a variety of current research applications. Topics include electromagnetic theory for dielectric and conductive materials, flow control, cardiovascular and respiratory models, homogenization and systems theory, optimal and geometric control, reduced-order models for large-scale systems, smart materials, and nondestructive evaluation and structural health monitoring for systems, including nuclear power plants. A unifying theme throughout the book focuses on the necessity of considering model development, numerical approximation, parameter estimation through inverse problem techniques, and control design in concert to achieve the stringent design criteria dictated by present applications.