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FRACTIONAL ORDER SYSTEMS

Modeling and Control Applications

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Annotaion: This book aims to propose the implementation and application of Fractional Order Systems (FOS). It is well known that FOS can be utilized in control applications and systems modeling, and their effectiveness has been proven in many theoretical works and simulation routines. A further and mandatory step for FOS real world utilization is their hardware implementation and applications on real systems modeling. With this viewpoint, introductory chapters are included on the definition of stability region of Fractional Order PID Controller and Chaotic FOS, followed by the practical implementation based on Microcontroller, Field Programmable Gate Array, Field Programmable Analog Array and Switched Capacitor. Another section is dedicated to FO modeling of Ionic Polymeric Metal Composite (IPMC). This new material will have applications in robotics, aerospace and biomedicine.

Contents: * Fractional Order Systems * Fractional Order PID Controller and Their Stability Regions Definition * Fractional Order Chaotic Systems * Field Programmable Gate Array Implementation * Microprocessor Implementation and Applications * Field Programmable Analog Array Implementation * Switched Capacitor and Integrated Circuit Design * Fractional Order Model of IPMC

Readership: Graduates, researchers and professionals interested in applying fractional order systems.

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