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Electronic Interfaces for Differential Capacitive Sensors

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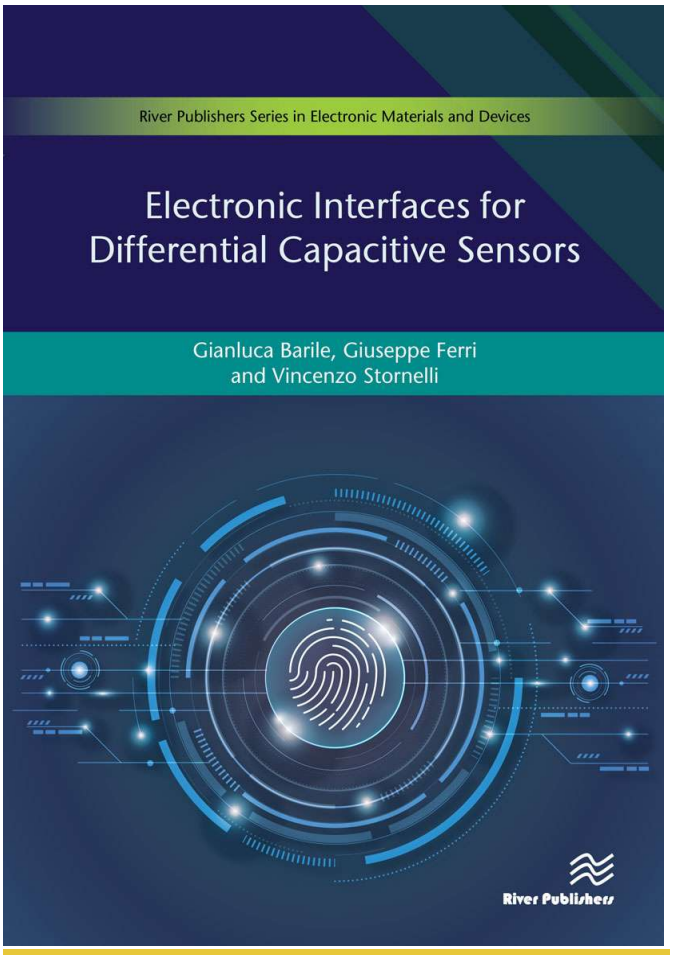
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In a world where great efforts are spent designing and creating more complex, yet efficient systems, sensing elements and related readout circuits, which constitute an integral part of them, need to be designed fulfilling these constraints, beside the common key parameters, such as high sensitivity, resolution and accuracy. Capacitive sensors and their differential subset provide virtually no energy dissipation, show insensitivity to temperature variations and have the capability to be micromachined directly onto a silicon substrate, together with the readout interface. Designing a readout circuit that takes advantage of these benefits, according to any specific application, is thus of utmost importance. This volume introduces the reader to state-of-the-art techniques and research achievements in interfacing differential capacitance sensors.

Technical topics discussed in the book include:

- Switched capacitor based interfaces;
- Voltage mode, differential capacitance to time, voltage, digital converters;
- Current mode interfaces based on standard components;
- Current mode interfaces based on CCIIs and VCIIs;
- Principles of second generation current and voltage conveyors.

This book gives the reader a comprehensive overview on the working principles, equivalent circuit models and most advanced interfacing techniques for differential capacitive transducers, highlighting benefits and downsides of each option. Electronic interfaces for differential capacitive sensors is an ideal text for academic staff and Masters/research students in electronic and microelectronic engineering.



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