

Sensors and Actuators: Engineering System Instrumentation, Second Edition

By Clarence W. de Silva

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Sensors and Actuators: Engineering System Instrumentation, Second Edition By Clarence W. de Silva

An engineering system contains multiple components that interconnect to perform a specific task. Starting from basic fundamentals through to advanced applications, **Sensors and Actuators: Engineering System Instrumentation, Second Edition** thoroughly explains the inner workings of an engineering system. The text first provides introductory material?practical procedures and applications in the beginning?and then methodically integrates more advanced techniques, theory, and concepts throughout the book. Emphasizing sensors, transducers, and actuators, the author discusses important aspects of component matching and interconnection, interface between the connected components, signal modification, and signal conditioning/modification. He also addresses functions, physical principles, operation and interaction, and the proper selection and interfacing of these components for various engineering/control applications.

This second edition provides a thorough revision of the first and includes new worked examples, new applications, and thoroughly updated as well as entirely new material. In addition, it provides increased coverage of sensor systems technologies and updated coverage of computer tools, including MATLAB®, Simulink, and LabView.

What’s New in the Second Edition:

- A new chapter on estimation from measurements, which includes various practical procedures and applications of estimation through sensed data
- New material on microelectromechanical systems (MEMS)
- New material on multisensor data fusion
- New material on networked sensing and localization
- Many new problems and worked examples
- Chapter highlights and summary sheets, for easy reference and recollection

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provides users from a variety of engineering backgrounds with a complete overview of engineering system components for instrumentation. It presents current techniques, advanced theory and concepts, and addresses relevant design issues, component selection, and practical applications.

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Editorial Review

Review

"… Professor de Silva has provided us with yet another excellent engineering undergraduate textbook. The content is uniquely both broad and focused providing the opportunity to explore a wide range of different aspects of engineering instrumentation and applications in detail. However, more impressive still is the exceptional presentation clarity of the material which covers the full range of engineering interests from analytical fundamentals, modeling approaches, component selection methods, and design techniques. Included are extensive examples and case studies highlighting the practical application of basic concepts, analysis tools, and design strategies."
?Chris K. Mechefske, Department of Mechanical and Materials Engineering, Queen’s University, Kingston, Canada

"This book is essential in the area of sensors and actuators as it provides comprehensive information for students at undergraduate and graduate levels and also researchers, scientists, and engineers."
?Farbod Khoshnoud, Brunel University London

"I have taught the instrumentation course in the Mechanical Engineering Department at my university for ten consecutive years. I switched the textbook for the course to first edition of this book when it first became available, because I and my faculty colleagues felt it was crucial that our instrumentation course cover ‘the whole picture’ of instrumentation, including actuators and impedance matching and signal conditioning issues. I have always felt that de Silva’s book was the best available in that regard. And I look forward now to working, likewise, with this, the second edition of the book. Thank you!"
?Martin C. Berg, Associate Professor, Department of Mechanical Engineering, University of Washington

"This book provides an excellent introduction for bachelor students into the design of complex systems containing multiple sensors and actuators. The illustrative examples and problems help students to quickly grasp the fundamental concepts and to see the trade-offs in the system design process. The book offers an excellent basis for designing a course on sensors and actuators."
?Sander Stuijk, Eindhoven University of Technology

About the Author

Dr. Clarence W. de Silva is a professor of mechanical engineering at the University of British Columbia, Vancouver, Canada. He earned his PhDs from Massachusetts Institute of Technology (1978) and the University of Cambridge, England (1998), and an honorary DEng from the University of Waterloo (2008). He has published and edited numerous books, chapters, journal articles, and conference papers. His recent books include ***Mechanics of Materials*** (Taylor & Francis/CRC, 2014), ***Mechatronics?A Foundation Course*** (Taylor & Francis/CRC, 2010); ***Modeling and Control of Engineering Systems*** (Taylor & Francis/CRC, 2009); and ***Sensors and Actuators: Control System Instrumentation*** (Taylor & Francis/CRC, 2007).

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Hye Elliott:

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