



Building Performance Simulation for Design and Operation

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Effective building performance simulation can reduce the environmental impact of the built environment, improve indoor quality and productivity, and facilitate future innovation and technological progress in construction. It draws on many disciplines, including physics, mathematics, material science, biophysics and human behavioural, environmental and computational sciences. The discipline itself is continuously evolving and maturing, and improvements in model robustness and fidelity are constantly being made. This has sparked a new agenda focusing on the effectiveness of simulation in building life-cycle processes.

Building Performance Simulation for Design and Operation begins with an introduction to the concepts of performance indicators and targets, followed by a discussion on the role of building simulation in performance-based building design and operation. This sets the ground for in-depth discussion of performance prediction for energy demand, indoor environmental quality (including thermal, visual, indoor air quality and moisture phenomena), HVAC and renewable system performance, urban level modelling, building operational optimization and automation.

Produced in cooperation with the International Building Performance Simulation Association (IBPSA), and featuring contributions from fourteen internationally recognised experts in this field, this book provides a unique and comprehensive overview of building performance simulation for the complete building life-cycle from conception to demolition. It is primarily intended for advanced students in building services engineering, and in architectural, environmental or mechanical engineering; and will be useful for building and systems designers and operators.

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Editorial Review

About the Author

Jan L. M. Hensen (Ph.D. & M.S., Eindhoven University of Technology) has his background in building physics and mechanical engineering. His professional interest is performance-based design in the interdisciplinary area of building physics, indoor environment and building systems. His teaching and research focuses on the development and application of computational building performance modelling and simulation for high performance.

Roberto Lamberts is a Professor in Construction at the Department of Civil Engineering of the Federal University of Santa Catarina, Brazil. He is also currently a board member of the IBPSA, Vice-President of the Brazilian Session and Counsellor of the Brazilian Council for Sustainable Buildings.

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