

# Preface

This book contains 17 chapters, which is written by selected experts who have present high-quality papers on topics closely relevant to the theme of nano devices, sensors, and MEMS. We can understand current status, challenges, and future directions on design, fabrication, simulation, reliability, and applications of nanoscale semiconductor devices, MEMS, and sensors from this book.

The field of nanoelectronic is evolving rapidly, and novel nanoscale devices are being investigated and developed at many leading research labs and companies worldwide. Nanoscale semiconductor devices, MEMS, and sensors are the backbone for realizing the next-generation Internet of things. The research of design, fabrication, reliability, modeling, simulation, and applications of these nanoscale electron components is becoming more and more important to achieve further technology breakthrough. Learning how the nanoscale structure interacts with the electrical and/or optical performances, how to find optimal solutions to achieve the best outcome, how these apparatuses can be designed via models and simulations, how to improve the reliability, and what are possible challenges and roadblocks moving forward is necessary to any relative researchers.

This is a book that describes the dielectric and noise analysis of MOS devices, devices modeling and CMOS technology, and medical application in MEMS and sensors, as well as relative fabrication and optimizing technology. It is really a book which provides readers important information related to the recent development on these nanoelectron apparatuses and challenges of realizing the nano devices moving forward that shows processes and materials needed for fabrication and the interaction of nanoscale structure and electrical and/or optical behavior, as well as the performance optimization and reliability analysis by modeling and simulating. Springer is highly desirable and can offer engineers, research scientists, and students a much needed reference in this field.

Last but not the least, we want to express our deep appreciation to the endless support from writers of this book. Also, we really hope that the readers can access

up-to-date and critical knowledge on the design, fabrication, simulation, and reliability of the increasingly important nanoscale electron apparatuses from a single book. Know more about nowadays and think more about the future. Let Springer be a window through which we can discover and explore deeper in this field.

Chengdu, China

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