1. Record Nr. UNINA9910597902003321

Titolo	Thermodynamics and Statistical Mechanics of Small Systems / / edited by Andrea Puglisi, Alessandro Sarracino, Angelo Vulpiani
Pubbl/distr/stampa	Basel, Switzerland : , : MDPI - Multidisciplinary Digital Publishing Institute, , 2018
Descrizione fisica	1 online resource (334 pages)
Disciplina	621.4021
Soggetti	Thermodynamics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Sommario/riassunto	A challenging frontier in modern statistical physics concerns systems with a small number of degrees of freedom, far from the thermodynamic limit. Beyond the general interest in the foundation of statistical mechanics, the relevance of this subject is due to the recent increase of resolution in the observation and manipulation of biological and man-made objects at micro- and nano-scales. A peculiar feature of small systems is the role played by fluctuations, which cannot be neglected and are responsible for many non-trivial behaviors. The study of fluctuations of thermodynamic quantities, such as energy or entropy, goes back to Einstein, Onsager, and Kubo; more recently, interest in this matter has grown with the establishment of new fluctuation-dissipation relations, and of so-called stochastic thermodynamics. This turning point has received a strong impulse from the study of systems that are far from the thermodynamic equilibrium, due to very long relaxation times, as in disordered systems, or due to the presence of external forcing and dissipation, as in granular or active matter. Applications of the thermodynamic and statistical mechanics of small systems range from molecular biology to micro-mechanics, including models of nano-transport, Brownian motors, and (living or artificial) self-propelled organisms.

2. Record Nr. UNINA9910918595603321

Autore	Karcz W. Konrad
Titolo	Artificial Intelligence and the Perspective of Autonomous Surgery / / edited by Konrad Karcz, Zbigniew Nawrat, Andrew A. Gumbs
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2024
ISBN	9783031685743
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (275 pages)
Collana	Medicine Series
Altri autori (Persone)	NawratZbigniew GumbsAndrew A
Disciplina	617
Soggetti	Surgery Artificial intelligence Health services administration Robotics Automation Artificial Intelligence Health Care Management Intel·ligència artificial Robòtica en medicina Cirurgia Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	PART ONE: FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE SURGERY -- 1.1 -- Medical Robots and Minimally Invasive Surgery driven by Artificial Intelligence - MR&MIS AI -- 1.2. Importance of the Data in the Surgical Environment -- 1.3. The challenges of deep learning in artificial intelligence and autonomous actions in surgery -- 1.4. Towards autonomous robotic-assisted interventions — the value of proximally placed audio sensors for surface and event characterization -- 1.5. Machine learning in surgery: Big Data -- 1.6. Artificial Intelligence and the Perspective of Autonomous Surgery: 3D Printing -- 1.7. Does Size Matter in Surgical Robots? -- 1.8. Promises and Perils of Artificial Intelligence in Surgery: The Critical Pathways for Successful

Healthcare Outcomes -- 1.9. The Evolution of Minimally Invasive Robotic Surgery: Addressing Limitations and Forging Ahead? -- PART TWO: CLINICAL IMPLICATIONS -- 2.1. Artificial Intelligence for Medical Image Analysis: An Opportunity for Automation -- 2.2. Radiomics in Surgery: preoperative prediction of cancer in lung and other areas -- 2.3. Application of artificial intelligence based on preoperative and intraoperative imaging to hepatobiliary surgery -- 2.4. Limitations and opportunities of telemedicine -- 2.5. Revolution of Robotics and Automation in Vascular Surgery -- 2.6. Robotics for Visceral Surgery -- 2.7. Machine Learning assisting Robots -- 2.8. Does Level 5 Autonomy Already Exist in Surgery? -- PART THREE: Artificial Influence and Hospital Environment -- 3.1. Medical Training for Machines and Software -- 3.2. Surgery 4.0 in the Operating Room -- 3.3. Medical Authonomy: a Proposal for Modifying Regulation of Surgical Devices that Utilize Artificial Intelligence.

Sommario/riassunto

This book has two heroes - the surgeon and the robot. The education system and intelligence can create a human who is specialized in surgery. While the accurate analysis of data with machine learning, AI, can create a more autonomous robot for surgery. Currently, robots still require human input in the decision-making loop, whether or not this will always be the case is an issue that still needs to be debated, analyzed and studied, preferably by computer scientists AND surgeons. Surgeons and their patients are increasingly opting for less invasive surgeries. However, among their many advantages, there is an important issue: less invasiveness always means limited access to direct information from the operating field (3D image, local palpation sensations, all information about the "whole" patient and feedback from the accompanying team during teleoperation). To increase precision, we are increasingly using surgical robots and mechatronic instruments. The less invasive the surgery and the greater the precision of robotic micro-instruments, the greater the role of artificial intelligence methods, especially machine learning, which supports the surgeon in making decisions, planning and performing the procedure. The development of artificial intelligence and further evidence of its effectiveness in various application fields mean that the work of a doctor is changing today. In the book, we address the issue of AI surgery, asking whether this means that an AI surgeon will be created? A key question about autonomous surgical robots will come up regularly: how far can we go with their autonomy while maintaining safe and effective procedures? The book provides useful information on both early successes, failures, and expectations related to the development of new technologies in surgery. It is a guide written by various experts, intended for a wide audience: from medical development planners, through students, to doctors and decision-makers.