1. Record Nr. UNISA990000218550203316

Titolo	Differential geometry, group representations, and quantization / J. D. Hennig ... [et al.] (eds.)
Pubbl/distr/stampa	Berlin [etc.] : Springer-Verlag, copyr. 1991
ISBN	3-540-53941-7
Descrizione fisica	XI, 280 p. : ill. ; 25 cm
Collana	Lecture notes in physics ; 379
Disciplina	51636
Collocazione	530 LNP (379)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia

2. Record Nr. UNINA9911006713003321

Titolo	Advances in computers . Volume 98 / / Edited by Ali R. Hurson
Pubbl/distr/stampa	Amsterdam, Netherlands : , : Elsevier, , 2015
ISBN	9780128023402 0128023406 9780128021323 0128021322
Edizione	[First edition.]
Descrizione fisica	1 online resource (247 p.)
Collana	Advances in computers, , 0065-2458 ; ; v. 98
Disciplina	005.12
Soggetti	Computers Graphical user interfaces (Computer systems) System analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and indexes.

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Sommario/riassunto

The theme of this 98th volume is inspired by the advances in information technology. Within the spectrum of information technology, this volume touches a variety of topics ranging from computer architecture and energy-efficient design techniques, cyber-physical critical infrastructure systems, model-based testing, and multi-objective optimization methods. The volume is a collection of four chapters that were solicited from authorities in the field, each of whom brings to bear a unique perspective on the topic. (1) Architecture-Level Power- and Energy-Efficient Design Techniques, articulate the holistic consideration of power and energy consumption of computer systems at all design levels without sacrificing the processing power. Several circuit and architectural metrics are defined, the notion of dynamic and static energy is discussed, distinction between power and energy is articulated, and metrics such as “Energy-Delay Product” and “Energy per Instruction” are introduced. (2) Data Corruption in Cyber-Physical Critical Infrastructure Systems, and emphasizes the effect of data corruption, either intentional (i.e., cyber, physical, or cyber-physical attacks) or unintentional (i.e., failures in sensors, processors, storage, or communication hardware), within the scope of critical cyber-physical systems (i.e., power grids, intelligent water distribution networks, smart transportation systems). It presents a comprehensive analysis of various data corruption and mitigation techniques. Finally, a number of studies on the negative effects of system execution on corrupted data are presented. (3) Tool-Supported Model-Based Testing of Requirements-Based Designs, address software testing objectives as a means to gain confidence in software products through fault detection, by observing the differences between the behavior of the implementation and the expected behavior described in the specification. The Chapter presents an overview of and classifies the state of the art in tool-supported model-based testing with an eye toward gaining insight into the gaps in the current tools used by industry and academia. (4) "Preference Incorporation in Evolutionary Multiobjective Optimization" presents a survey of the "State of the Art" and emphasizes the application of evolutionary algorithms as a means for multi-objective optimization. A classification of preference-based Multiobjective Optimization Evolutionary Algorithms based on the structure of the decision maker's preference information is presented and several approaches are discussed and

analyzed.