1. Record Nr. UNINA9910407729803321

Autore	Nellippallil Anand Balu
Titolo	Architecting Robust Co-Design of Materials, Products, and Manufacturing Processes / / by Anand Balu Nellippallil, Janet K. Allen, B. P. Gautham, Amarendra K. Singh, Farrokh Mistree
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2020
ISBN	3-030-45324-3
Edizione	[1st ed. 2020.]
Descrizione fisica	1 online resource (368 pages)
Disciplina	620.001171
Soggetti	Engineering—Materials Engineering design Manufactures Computer simulation Materials Engineering Engineering Design Manufacturing, Machines, Tools, Processes Simulation and Modeling
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Frame of Reference: Integrated Design of Materials, products, and associated manufacturing processes -- Literature Review: Integrated Materials, Products and Process Design Current Trends and Practices -- Design Foundations: State of the Art in Decision-Based Design, Robust Design Approaches, and Platform for Decision Support -- Integrated Realization of Engineered Materials and Products – Design of Steel Manufacturing Process Chain -- Goal-Orientated, Inverse Design Method: The Horizontal Integration of a Multi-Stage Hot Rod Rolling System -- Integrated Design Exploration of Materials, Products and Manufacturing Processes using Goal-Orientated Inverse Design Method -- Robust Concept Exploration of Materials, Products and Associated Manufacturing Processes -- PDSIDES: A Knowledge-Based Platform for Decision Support in the Design of Engineering Systems -- Advancing the Vision for the Systems-Based Design Architecture via a Cloud-

Based Platform for Decision Support in the Design of Engineered Systems (CB-PDSIDES).

Sommario/riassunto

This book explores systems-based, co-design, introducing a “Decision-Based, Co-Design” (DBCD) approach for the co-design of materials, products, and processes. In recent years there have been significant advances in modeling and simulation of material behavior, from the smallest atomic scale to the macro scale. However, the uncertainties associated with these approaches and models across different scales need to be addressed to enable decision-making resulting in designs that are robust, that is, relatively insensitive to uncertainties. An approach that facilitates co-design is needed across material, product design and manufacturing processes. This book describes a cloud-based platform to support decisions in the design of engineered systems (CB-PDSIDES), which feature an architecture that promotes co-design through the servitization of decision-making, knowledge capture and use templates that allow previous solutions to be reused. Placing the platform in the cloud aids mass collaboration and open innovation. A valuable reference resource reference on all areas related to the design of materials, products and processes, the book appeals to material scientists, design engineers and all those involved in the emerging interdisciplinary field of integrated computational materials engineering (ICME).