

# Wafer Fabrication Factory Performance And Analysis The Springer International Series In Engineering And Computer Science

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*Organizational Efficiency through Intelligent Information Technologies* - Sugumaran, Vijayan 2012-09-30  
"This book explores various aspects of design and development of intelligent technologies by bringing together the latest in research in the fields of information systems, intelligent agents, collaborative works and much more"--Provided by publisher.

**Wafer Fabrication** - Jie Zhang 2018-09-24

This book systematically introduces modeling, performance evaluation and applications of Automatic Materiel Handling System (AMHS) in semiconductor manufacturing, and focuses discussion on the coordination of two subsystems. Resources dispatch and optimization are conducted on operational research combined with cases studies. Written in a practical way, it is an essential reference for researchers and engineers in manufacturing and management.

**Management of Cycle Time in Semiconductor Wafer Fabrication** - Adeel Najmi 1993

**Advances in Modeling and Simulation** - Andreas Tolk 2017-08-27

This broad-ranging text/reference presents a fascinating review of the state of the art of modeling and simulation, highlighting both the seminal work of preeminent authorities and exciting developments from promising young researchers in the field. Celebrating the 50th anniversary of the Winter Simulation Conference (WSC), the premier international forum for disseminating recent advances in the field of system simulation, the book showcases the historical importance of this influential conference while also looking forward to a bright future for the simulation community. Topics and features: examines the challenge of constructing valid and efficient models, emphasizing the benefits of the process of simulation modeling; discusses model calibration, input model risk, and approaches to validating emergent behaviors in large-scale complex systems with non-linear interactions; reviews the evolution of simulation languages, and the history of the Time Warp algorithm; offers a focus on the design and analysis of simulation experiments under various goals, and describes how data can be "farmed" to support decision making; provides a comprehensive overview of Bayesian belief models for simulation-based decision making, and introduces a model for ranking and selection in cloud computing; highlights how input model uncertainty impacts simulation optimization, and proposes an approach to quantify and control the impact of input model risk; surveys the applications of simulation in semiconductor manufacturing, in social and behavioral modeling, and in military planning and training; presents data analysis on the publications from the Winter Simulation Conference, offering a big-data perspective on the significant impact of the conference. This informative and inspiring volume will appeal to all academics and professionals interested in computational and mathematical modeling and simulation, as well as to graduate students on the path to form the next generation of WSC pioneers.

**Information Control Problems in Manufacturing 2006** - Alexandre Dolgui 2011-10-10

Information Control Problems in Manufacturing 2006 contains the Proceedings of the 12th IFAC Symposium on Information Control Problems in Manufacturing (INCOM'2006). This symposium took place

in Saint Etienne, France, on May 17-19 2006. INCOM is a tri-annual event of symposia series organized by IFAC and it is promoted by the IFAC Technical Committee on Manufacturing Plant Control. The purpose of the symposium INCOM'2006 was to offer a forum to present the state-of-the-art in international research and development work, with special emphasis on the applications of optimisation methods, automation and IT technologies in the control of manufacturing plants and the entire supply chain within the enterprise. The symposium stressed the scientific challenges and issues, covering the whole product and processes life cycle, from the design through the manufacturing and maintenance, to the distribution and service. INCOM'2006 Technical Program also included a special event on Innovative Engineering Techniques in Healthcare Delivery. The application of engineering and IT methods in medicine is a rapidly growing field with many opportunities for innovation. The Proceedings are composed of 3 volumes: Volume 1 - Information Systems, Control & Interoperability Volume 2 - Industrial Engineering Volume 3 - Operational Research \* 3-volume set, containing 362 carefully reviewed and selected papers \* presenting the state-of-the-art in international research and development in Information Control problems in Manufacturing Manufacturing Engineering and Process II - Bale V. Reddy 2013-06-13

Collection of selected, peer reviewed papers from the ICMEP 2013 International Conference on Manufacturing Engineering and Process, April 13-14, 2013, Vancouver, Canada. The 373 papers are grouped as follows: Chapter 1: Advanced Materials Engineering and Technology; Chapter 2: General Mechanical Engineering; Chapter 3: Design Technology and Engineering; Chapter 4: Applied Thermodynamics, Heat Transfer, Energy Conversion; Chapter 5: Electrical Engineering and Electric Machines; Chapter 6: Power System and Energy Engineering: Its Applications; Chapter 7: Instrumentation, Measurement Technologies, Analysis and Methodology; Chapter 8: Electronics and Integrated Circuits, Embedded Technology and Applications; Chapter 9: Mechatronics and Robotics; Chapter 10: Modern Control, Automation and Reverse Engineering; Chapter 11: New Technology, Method and Technique in Civil Engineering; Chapter 12: Manufacturing and Industrial Engineering, Management Applications; Chapter 13: Mathematics - in Particular, Calculus, Differential Equations, Statistics, and Linear Algebra; Chapter 14: Signal Processing and Data Mining; Chapter 15: Information Technologies and Networks: Its Applications.

**Production Planning and Control for Semiconductor Wafer Fabrication Facilities** - Lars Mönch 2012-09-14

Over the last fifty-plus years, the increased complexity and speed of integrated circuits have radically changed our world. Today, semiconductor manufacturing is perhaps the most important segment of the global manufacturing sector. As the semiconductor industry has become more competitive, improving planning and control has become a key factor for business success. This book is devoted to production planning and control problems in semiconductor wafer fabrication facilities. It is the first book that takes a comprehensive look at the role of modeling, analysis, and related information systems for such manufacturing systems. The book provides an operations research- and computer science-based

introduction into this important field of semiconductor manufacturing-related research.

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Fifth International Conference on Factory 2000 - the Technology Exploitation Process, 2-4 April, 1997 - 1997

**Handbook of Semiconductor Manufacturing Technology** - Yoshio Nishi 2017-12-19

Retaining the comprehensive and in-depth approach that cemented the bestselling first edition's place as a standard reference in the field, the Handbook of Semiconductor Manufacturing Technology, Second Edition features new and updated material that keeps it at the vanguard of today's most dynamic and rapidly growing field. Iconic experts Robert Doering and Yoshio Nishi have again assembled a team of the world's leading specialists in every area of semiconductor manufacturing to provide the most reliable, authoritative, and industry-leading information available. Stay Current with the Latest Technologies In addition to updates to nearly every existing chapter, this edition features five entirely new contributions on... Silicon-on-insulator (SOI) materials and devices Supercritical CO<sub>2</sub> in semiconductor cleaning Low- $\kappa$  dielectrics Atomic-layer deposition Damascene copper electroplating Effects of terrestrial radiation on integrated circuits (ICs) Reflecting rapid progress in many areas, several chapters were heavily revised and updated, and in some cases, rewritten to reflect rapid advances in such areas as interconnect technologies, gate dielectrics, photomask fabrication, IC packaging, and 300 mm wafer fabrication. While no book can be up-to-the-minute with the advances in the semiconductor field, the Handbook of Semiconductor Manufacturing Technology keeps the most important data, methods, tools, and techniques close at hand.

Formal Methods in Manufacturing - Javier Campos 2018-09-03

Illustrated with real-life manufacturing examples, Formal Methods in Manufacturing provides state-of-the-art solutions to common problems in manufacturing systems. Assuming some knowledge of discrete event systems theory, the book first delivers a detailed introduction to the most important formalisms used for the modeling, analysis, and control of manufacturing systems (including Petri nets, automata, and max-plus algebra), explaining the advantages of each formal method. It then employs the different formalisms to solve specific problems taken from today's industrial world, such as modeling and simulation, supervisory control (including deadlock prevention) in a distributed and/or decentralized environment, performance evaluation (including scheduling and optimization), fault diagnosis and diagnosability analysis, and reconfiguration. Containing chapters written by leading experts in their respective fields, Formal Methods in Manufacturing helps researchers and application engineers handle fundamental principles and deal with typical quality goals in the design and operation of manufacturing systems.

**Design and Management of Manufacturing Systems** - Arkadiusz Gola 2021-09-02

Although the design and management of manufacturing systems have been explored in the literature for

many years now, they still remain topical problems in the current scientific research. The changing market trends, globalization, the constant pressure to reduce production costs, and technical and technological progress make it necessary to search for new manufacturing methods and ways of organizing them, and to modify manufacturing system design paradigms. This book presents current research in different areas connected with the design and management of manufacturing systems and covers such subject areas as: methods supporting the design of manufacturing systems, methods of improving maintenance processes in companies, the design and improvement of manufacturing processes, the control of production processes in modern manufacturing systems production methods and techniques used in modern manufacturing systems and environmental aspects of production and their impact on the design and management of manufacturing systems. The wide range of research findings reported in this book confirms that the design of manufacturing systems is a complex problem and that the achievement of goals set for modern manufacturing systems requires interdisciplinary knowledge and the simultaneous design of the product, process and system, as well as the knowledge of modern manufacturing and organizational methods and techniques.

IJCAI - 2007

Parallel and Distributed Discrete Event Simulation - Carl Tropper 2002

Discrete-event simulation has long been an integral part of the design process of complex engineering systems and the modelling of natural phenomena. Many of the systems that we seek to understand or control can be modelled as digital systems. In a digital model, we view the system at discrete instants of time, in effect taking snapshots of the system at these instants. For example, in a computer network simulation an event can be the sending of a message from one node to another node while in a VLSI logic simulation, the arrival of a signal at a gate may be viewed as an event. Digital systems such as computer systems are naturally susceptible to this approach. However, a variety of other systems may also be modelled this way. These include transportation systems such as air-traffic control systems, epidemiological models such as the spreading of a virus, and military war-gaming models. This book is representative of the advances in this field.

Knowledge Engineering and Management - Yinglin Wang 2011-11-25

Proceedings of the Sixth International Conference on Intelligent System and Knowledge Engineering presents selected papers from the conference ISKE 2011, held December 15-17 in Shanghai, China. This proceedings doesn't only examine original research and approaches in the broad areas of intelligent systems and knowledge engineering, but also present new methodologies and practices in intelligent computing paradigms. The book introduces the current scientific and technical advances in the fields of artificial intelligence, machine learning, pattern recognition, data mining, information retrieval, knowledge-based systems, knowledge representation and reasoning, multi-agent systems, natural-language processing, etc. Furthermore, new computing methodologies are presented, including cloud computing, service computing and pervasive computing with traditional intelligent methods. The proceedings will be beneficial for both researchers and practitioners who want to utilize intelligent methods in their specific research fields. Dr. Yinglin Wang is a professor at the Department of Computer Science and Engineering, Shanghai Jiao Tong University, China; Dr. Tianrui Li is a professor at the School of Information Science and Technology, Southwest Jiaotong University, China.

*Contemporary Issues in Systems Science and Engineering* - MengChu Zhou 2015-03-30

Various systems science and engineering disciplines are covered and challenging new research issues in these disciplines are revealed. They will be extremely valuable for the readers to search for some new research directions and problems. Chapters are contributed by world-renowned systems engineers. Chapters include discussions and conclusions. Readers can grasp each event holistically without having professional expertise in the field.

**Proceedings of the ... Symposium on Automated Integrated Circuits Manufacturing** - 1990

**IEEE/SEMI International Semiconductor Manufacturing Science Symposium** - 1990

## **Journal of Research of the National Institute of Standards and Technology - 1995**

### Big Data Platforms and Applications - Florin Pop 2021-09-28

This book provides a review of advanced topics relating to the theory, research, analysis and implementation in the context of big data platforms and their applications, with a focus on methods, techniques, and performance evaluation. The explosive growth in the volume, speed, and variety of data being produced every day requires a continuous increase in the processing speeds of servers and of entire network infrastructures, as well as new resource management models. This poses significant challenges (and provides striking development opportunities) for data intensive and high-performance computing, i.e., how to efficiently turn extremely large datasets into valuable information and meaningful knowledge. The task of context data management is further complicated by the variety of sources such data derives from, resulting in different data formats, with varying storage, transformation, delivery, and archiving requirements. At the same time rapid responses are needed for real-time applications. With the emergence of cloud infrastructures, achieving highly scalable data management in such contexts is a critical problem, as the overall application performance is highly dependent on the properties of the data management service.

### **Handbook of Production Scheduling** - Jeffrey W. Herrmann 2006-08-18

This book concentrates on real-world production scheduling in factories and industrial settings. It includes industry case studies that use innovative techniques as well as academic research results that can be used to improve production scheduling. Its purpose is to present scheduling principles, advanced tools, and examples of innovative scheduling systems to persons who could use this information to improve their own production scheduling.

### Decision Policies for Production Networks - Dieter Armbruster 2012-03-05

The financial results of any manufacturing company can be dramatically impacted by the repetitive decisions required to control a complex production network be it a network of machines in a factory; a network of factories in a company; or a network of companies in a supply chain. Decision Policies for Production Networks presents recent convergent research on developing policies for operating production networks including details of practical control and decision techniques which can be applied to improve the effectiveness and economic efficiency of production networks worldwide. Researchers and practitioners come together to explore a wide variety of approaches to a range of topics including: WIP and equipment management policies, Material release policies, Machine, factory, and supply chain network policies for delivery in the face of supply and demand variability, and Conflicts between complex production network models and their controlling policies. Case studies and relevant mathematical techniques are included to support and explain techniques such as heuristics, global and hierarchical optimization, control theory and filtering approaches related to complex systems or traffic flows. Decision Policies for Production Networks acts as handbook for researchers and practitioners alike, providing findings and information which can be applied to develop methods and advance further research across production networks.

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### **Operations Research Proceedings** - B. Fleischmann 2013-03-07

This proceedings volume contains a selection of 85 papers presented at the Symposium on Operations Research (OR 2000), the Annual Conference of the German Operations Research Society (GOR), that was held at the Dresden University of Technology, September 9 -12, 2000. The contributions cover the broad interdisciplinary spectrum of Operations Research and present recent advances in theory, development of methods, and applications in practice. Subjects covered are Mathematical Optimization (continuous, discrete, combinatorial and stochastic), Simulation, Econometrics, Statistics and Mathematical Economics, Decision Theory, Game Theory, Finance, Banking and Insurance, Artificial Intelligence and Fuzzy Logic,

Decision Support Systems, Production, Logistics and Supply Chain Management, Scheduling and Project Planning, Transport and Traffic, Energy and Environment, Marketing and Data Analysis and Didactics of Operations Research.

### **Production Planning and Control in Semiconductor Manufacturing** - Tin-Chih Toly Chen 2022-10-21

This book systematically analyzes the applicability of big data analytics and Industry 4.0 from the perspective of semiconductor manufacturing management. It reports in real examples and presents case studies as supporting evidence. In recent years, technologies of big data analytics and Industry 4.0 have been frequently applied to the management of semiconductor manufacturing. However, related research results are mostly scattered in various journal issues or conference proceedings, and there is an urgent need for a systematic integration of these results. In addition, many related discussions have placed too much emphasis on the theoretical framework of information systems rather than on the needs of semiconductor manufacturing management. This book addresses these issues.

### **Computer Integrated Manufacturing - Proceedings Of The 3rd International Conference (In 2 Volumes)** - Gay Robert 1995-07-10

### Contributions of DOE weapons labs and NIST to semiconductor technology -

### Process Plant Operating Procedures - Chuei-Tin Chang 2021-06-30

Process Plant Operating Procedures presents an introduction to the theory and applications of procedure synthesis that is primarily concerned with the task of conjecturing the sequence of controller (or operator) actions needed to achieve designated operational goals in a given system. In order to facilitate practical implementation, the formal problem statement, two alternative approaches, their validation methods and a series of realistic examples are provided. The authors explore Petri nets and automata to identify the best paths leading to the specified goal of operation. The model-building methods for characterising all components in the given system, as well as the required control specifications, are explained with simple examples. The sequential control actions and the corresponding time schedule can then be identified accordingly. This book exposes practitioners to an important area of plant operations, teaching them effective approaches for procedure synthesis, enabling them to construct and solve scheduling models, and providing them with tools for simulation and validation of procedures and schedules. It is written for readers with a basic understanding of process design and control activities, and it will appeal to engineers in diverse fields with an interest in synthesizing operating procedures in process plants. Advances in Industrial Control reports and encourages the transfer of technology in control engineering. The rapid development of control technology has an impact on all areas of the control discipline. The series offers an opportunity for researchers to present an extended exposition of new work in all aspects of industrial control.

### **Semiconductor Technologies** - Jan Grym 2010-04-01

Semiconductor technologies continue to evolve and amaze us. New materials, new structures, new manufacturing tools, and new advancements in modelling and simulation form a breeding ground for novel high performance electronic and photonic devices. This book covers all aspects of semiconductor technology concerning materials, technological processes, and devices, including their modelling, design, integration, and manufacturing.

### Proceedings of the Third Symposium on Automated Integrated Circuits Manufacturing - Joseph B. Anthony 1988

### **Wafer Fabrication: Factory Performance and Analysis** - Linda F. Atherton 1995-12-14

This book is concerned with wafer fabrication and the factories that manufacture microprocessors and other integrated circuits. With the invention of the transistor in 1947, the world as we knew it changed. The transistor led to the microprocessor, and the microprocessor, the guts of the modern computer, has created an epoch of virtually unlimited information processing. The electronics and computer revolution has brought about, for better or worse, a new way of life. This revolution could not have occurred without wafer fabrication, and its associated processing technologies. A microprocessor is fabricated via a lengthy, highly-

complex sequence of chemical processes. The success of modern chip manufacturing is a miracle of technology and a tribute to the hundreds of engineers who have contributed to its development. This book will delineate the magnitude of the accomplishment, and present methods to analyze and predict the performance of the factories that make the chips. The set of topics covered juxtaposes several disciplines of engineering. A primary subject is the chemical engineering aspects of the electronics industry, an industry typically thought to be strictly an electrical engineer's playground. The book also delves into issues of manufacturing, operations performance, economics, and the dynamics of material movement, topics often considered the domain of industrial engineering and operations research. Hopefully, we have provided in this work a comprehensive treatment of both the technology and the factories of wafer fabrication. Novel features of these factories include long process flows and a dominance of processing over operational issues.

*Modeling, Simulation, and Control of Flexible Manufacturing Systems* -

**Production Planning and Control for Semiconductor Wafer Fabrication Facilities** - Lars Mönch 2012-09-12

Over the last fifty-plus years, the increased complexity and speed of integrated circuits have radically changed our world. Today, semiconductor manufacturing is perhaps the most important segment of the global manufacturing sector. As the semiconductor industry has become more competitive, improving planning and control has become a key factor for business success. This book is devoted to production planning and control problems in semiconductor wafer fabrication facilities. It is the first book that takes a comprehensive look at the role of modeling, analysis, and related information systems for such manufacturing systems. The book provides an operations research- and computer science-based introduction into this important field of semiconductor manufacturing-related research.

*Engineered in Japan* - Jeffrey K. Liker 1995

Engineered in Japan presents a unique and comprehensive examination of technology management in the most successful Japanese companies: unique in that all chapters go beyond superficial descriptions of stylized practices to look in depth at particular issues, often contradicting or qualifying the conventional wisdom; comprehensive in that it covers the entire technology life cycle from basic R&D, to development engineering, to manufacturing processes, to learning from the Japanese. Each chapter is based on original research by noted scholars in the field, and identifies technology management practices that have become a major source of competitive advantage for highly successful Japanese companies. Engineered in Japan documents the best practices from such companies as Toyota, Hitachi, Toshiba, and Nippondenso, and discusses how these technology management practices can be usefully adopted in other cultural contexts. Going beyond past observations, the authors all delve below the surface of Japanese management approaches. They look more closely than has been done before at how particular methods are applied, and they identify some new practices that have not yet been highlighted in books on Japanese methods. Presenting recent data that contradict some conventional thinking about U.S.-Japanese differences, they look at old techniques from a new perspective. "U.S. managers can perhaps learn more from the process of creation in Japan and the organizational structures that support innovation," say the editors in their introduction, "than from the particular approaches, tools, and technologies created." A running theme throughout the book is that Japanese managers and engineers tend to think in terms of systems, focusing not just on the parts but on the connections between them. Engineered in Japan is must reading for technology managers and engineers, along with anyone interested in Japanese business, engineering, and management.

**Cleaning and Surface Conditioning Technology in Semiconductor Device Manufacturing 11** - Takeshi Hattori 2009-09

This issue of ECS Transactions includes papers presented during the 11th International Symposium on Cleaning and Surface Conditioning Technology in Semiconductor Device Manufacturing held during the ECS Fall Meeting in Vienna, Austria, October 4-9, 2009.

**Proceedings of the Fifth Symposium on Automated Integrated Circuits Manufacturing** - Vaughn E. Akins 1990

**Fundamentals of Semiconductor Manufacturing and Process Control** - Gary S. May 2006-05-26

A practical guide to semiconductor manufacturing from process control to yield modeling and experimental design Fundamentals of Semiconductor Manufacturing and Process Control covers all issues involved in manufacturing microelectronic devices and circuits, including fabrication sequences, process control, experimental design, process modeling, yield modeling, and CIM/CAM systems. Readers are introduced to both the theory and practice of all basic manufacturing concepts. Following an overview of manufacturing and technology, the text explores process monitoring methods, including those that focus on product wafers and those that focus on the equipment used to produce wafers. Next, the text sets forth some fundamentals of statistics and yield modeling, which set the foundation for a detailed discussion of how statistical process control is used to analyze quality and improve yields. The discussion of statistical experimental design offers readers a powerful approach for systematically varying controllable process conditions and determining their impact on output parameters that measure quality. The authors introduce process modeling concepts, including several advanced process control topics such as run-by-run, supervisory control, and process and equipment diagnosis. Critical coverage includes the following: \* Combines process control and semiconductor manufacturing \* Unique treatment of system and software technology and management of overall manufacturing systems \* Chapters include case studies, sample problems, and suggested exercises \* Instructor support includes electronic copies of the figures and an instructor's manual Graduate-level students and industrial practitioners will benefit from the detailed examination of how electronic materials and supplies are converted into finished integrated circuits and electronic products in a high-volume manufacturing environment. An Instructor's Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department. An Instructor Support FTP site is also available.

*Managing Complexity: Insights, Concepts, Applications* - Dirk Helbing 2007-10-13

The essays and lectures collected in this book center around knowledge transfer from the complex-system sciences to applications in business, industry and society, as viewed from a broad perspective. The contributions aim to raise awareness across the spectrum to meet the increasing need to integrate lessons from complexity research into everyday planning, decision making, logistics or optimization procedures and forecasting. The writing has been largely kept non-technical.

Digital Manufacturing & Automation III - Yong Hong Tan 2012-07-26

Volume is indexed by Thomson Reuters CPCI-S (WoS). Digital manufacturing and automation technology plays a more and more important role in advancing industry. These peer-reviewed papers report up-to-the-minute innovations and developments, and summarize state-of-the-art ideas for the benefit of domestic and foreign scholars and experts from areas such as mechatronics, digital manufacturing, deep-sea mining control technology and equipment automation, intelligent control and detection technology.

Intelligent Production Machines and Systems - First I\*PROMS Virtual Conference - Duc T. Pham 2005-12-09

The 2005 Virtual International Conference on IPROMS took place on the Internet between 4 and 15 July 2005. IPROMS 2005 was an outstanding success. During the Conference, some 4168 registered delegates and guests from 71 countries participated in the Conference, making it a truly global phenomenon. This book contains the Proceedings of IPROMS 2005. The 107 peer-reviewed technical papers presented at the Conference have been grouped into twelve sections, the last three featuring contributions selected for IPROMS 2005 by Special Sessions chairmen: - Collaborative and Responsive Manufacturing Systems - Concurrent Engineering - E-manufacturing, E-business and Virtual Enterprises - Intelligent Automation Systems - Intelligent Decision Support Systems - Intelligent Design Systems - Intelligent Planning and Scheduling Systems - Mechatronics - Reconfigurable Manufacturing Systems - Tangible Acoustic Interfaces (Tai Chi) - Innovative Production Machines and Systems - Intelligent and Competitive Manufacturing Engineering