

Exergy Analysis Of Combined Cycle Cogeneration Systems A

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Exergy, Energy System Analysis and Optimization

- Volume II - Christos A. Frangopoulos

2009-05-13

Exergy, Energy System Analysis, and Optimization theme is a component of the Encyclopedia of Energy Sciences, Engineering and Technology Resources which is part of the global Encyclopedia of Life Support Systems (EOLSS), an integrated compendium of twenty one Encyclopedias. These three volumes are organized into five different topics which represent the main scientific areas of the theme:

1. Exergy and Thermodynamic Analysis; 2.

3. Modeling, Simulation and Optimization in Energy Systems;
4. Artificial Intelligence and Expert Systems in Energy Systems Analysis;
5. Sustainability Considerations in the Modeling of Energy Systems.

Fundamentals and applications of characteristic methods are presented in these volumes. These three volumes are aimed at the following five major target audiences: University and College Students, Educators, Professional Practitioners, Research Personnel and Policy Analysts, Managers, and Decision Makers and NGOs.

Exergy, Energy System Analysis and Optimization

- **Volume I** - Christos A. Frangopoulos 2009-05-18

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Recycling and Reuse of Materials and Their

Products - Yves Grohens 2013-01-23

This important book is an overall analysis of different innovative methods and ways of recycling in connection with various types of materials. It aims to provide a basic understanding about polymer recycling and its reuse as well as presents an in-depth look at various recycling methods. It provides a thorough knowledge about the work being done in recycling in different parts of the world and throws light on areas that need to be further explored.

Emphasizing eco-friendly methods and recovery of useful materials The book covers a wide

variety of innovative recycling methods and research, including

- Green methods of recycling
- Effective conversion of biomass and municipal wastes to energy-generating systems
- A catalyst for the reuse of glycerol byproduct
- Methods of adsorption to treat wastewater and make it suitable for irrigation and other purposes
- Disposal of sludge
- The use of calcined clay to replace both fine and coarse aggregates
- Recycling of rubbers
- The production of a sorbent material for paper mill sludge
- Replacing polypropylene absorbent in oil spill sanitations
- The use of natural fibers for various industrial

applications • Cashew nut shell liquid as a source of surface active reagents • Integrated power and cooling systems based on biomass • Recycling water from household laundering • much more
Control, operation and trading strategies of intermittent renewable energy in smart grids -
Dongliang Xiao 2023-04-17

Renewable Energy and its Innovative Technologies - Jayeeta Chattopadhyay
2018-10-10

The book features innovative scientific research by scientists, academicians and students,

presented at the International Conference on Energy, Materials and Information Technology, 2017 at Amity University Jharkhand, India.

Covering all the promising renewable energies and their related technologies, such as wind, solar and biomass energy, it compiles current important scientific research in this field and addresses how it can be applied in an interdisciplinary manner. The selected conference papers provide important data and parameters for utilizing the main potential renewable energies, and allowing an economic and environmental assessment. The book is a valuable resource for

all those who are interested in the physical and technical principles of promising ways to utilize various renewable energies.

Fossil Energy Update - 1986

Gas Turbines - Gurrappa Injeti 2010-09-27

This book is intended to provide valuable information for the analysis and design of various gas turbine engines for different applications. The target audience for this book is design, maintenance, materials, aerospace and mechanical engineers. The design and maintenance engineers in the gas turbine and

aircraft industry will benefit immensely from the integration and system discussions in the book.

The chapters are of high relevance and interest to manufacturers, researchers and academicians as well.

Geothermal Energy Systems - Ibrahim Dincer
2021-03-25

Geothermal Energy Systems provides design and analysis methodologies by using exergy and enhanced exergy tools (covering exergoenvironmental, exergoeconomic, exergetic life cycle assessment, etc.), environmental impact assessment models, and sustainability models

and approaches. In addition to presenting newly developed advanced and integrated systems for multigenerational purposes, the book discusses newly developed environmental impact assessment and sustainability evaluation methods and methodologies. With case studies for integrated geothermal energy sources for multigenerational aims, engineers can design and develop new geothermal integrated systems for various applications and discover the main advantages of design choices, system analysis, assessment and development of advanced geothermal power systems. Explains the ability of

geothermal energy power systems to decrease global warming Discusses sustainable development strategies for using geothermal energy sources Provides new design conditions for geothermal energy sources-based district energy systems

Exergy - Silvio de Oliveira Junior 2012-11-02

Bridging the gap between concepts derived from Second Law of Thermodynamics and their application to Engineering practice, the property exergy and the exergy balance can be a tool for analyzing and improving the performance of energy conversion processes. With the exergy

analysis it is possible to evaluate the performance of energy conversion processes not only on a thermodynamics basis but also by including production costs and environmental aspects and impacts of the studied processes. This comprehensive approach of the use of energy has, as one of the most important feature, the identification of sustainable ways of energy resources utilization. Based on the fundamentals of the exergy concept, its calculation, graphical representations and exergy balances evaluation, Exergy: Production Cost And Renewability describes the application of detailed exergy and

thermoeconomic analysis to power plants and polygeneration systems, petroleum production and refining plants (including hydrogen production), chemical plants, biofuel production routes, combined production of ethanol and electricity, aircraft systems design, environmental impact mitigation processes and human body behavior. The presented case studies aim at providing students, researchers and engineers with guidelines to the utilization of the exergy and thermoeconomic analysis to model, simulate and optimize real processes and industrial plants. **Progress in Sustainable Energy Technologies Vol**

II - Ibrahim Dincer 2014-09-25

This multi-disciplinary volume presents information on the state-of-the-art in the sustainable development technologies and tactics. Its unique amalgamation of the latest technical information, research findings and examples of successfully applied new developments in the area of sustainable development will be of keen interest to engineers, students, practitioners, scientists and researchers concerned with sustainability. Problem statements, projections, new concepts, models, experiments, measurements and simulations from not only

engineering and science, but disciplines as diverse as ecology, education, economics and information technology are included, in order to create a truly holistic vision of the sustainable development field. The contributions feature coverage of topics including green buildings, exergy analysis, clean carbon technologies, waste management, energy conservation, environmental remediation, energy security and sustainable development policy.

Gas Turbine Combined Cycle Power Plants - S. Can Gülen 2019-12-06

This book covers the design, analysis, and

optimization of the cleanest, most efficient fossil fuel-fired electric power generation technology at present and in the foreseeable future. The book contains a wealth of first principles-based calculation methods comprising key formulae, charts, rules of thumb, and other tools developed by the author over the course of 25+ years spent in the power generation industry. It is focused exclusively on actual power plant systems and actual field and/or rating data providing a comprehensive picture of the gas turbine combined cycle technology from performance and cost perspectives. Material presented in this book

is applicable for research and development studies in academia and government/industry laboratories, as well as practical, day-to-day problems encountered in the industry (including OEMs, consulting engineers and plant operators).

Heat Conversion Systems - Georg Alefeld

1993-09-09

Heat Conversion Systems develops the underlying concepts of advanced Rankine-based absorption and compression cycles and introduces the Building Block Approach as a general concept. The Building Block Approach identifies all cycle configurations for a given

application to ensure that system designers have available all important alternatives. The book features numerous examples of advanced cycles and includes single- and multi-stage absorption heat pumps and heat transformers and combined systems. The book also discusses single- and multi-stage vapor compression systems with multiple solution circuits, multiple compressors, and cascades. Aspects of working fluid selection and their influence on cycle options, performance evaluation, and estimating procedures for the Coefficient of Performance (COP) are addressed. Cycle analysis based on the Second Laws of

Thermodynamics is examined. Heat Conversion Systems will be an important source for engineers in air-conditioning, heat pumping, refrigeration, and waste heat utilization. It can be used as text in courses on thermodynamics, efficient use of energy, and environmental protection.

Cogeneration and District Energy Systems - Marc A. Rosen 2016-09-29

This important book covers district energy and CHP technologies, as well as systems that combine them. It focuses on modelling, analysis and optimization, of cogeneration-based district energy systems

Thermal Cycles of Heat Recovery Power Plants -
Tangellapalli Srinivas 2021-04-02

Thermal Cycles of Heat Recovery Power Plants presents information about thermal power plant cycles suitable for waste heat recovery (WHR) in modern power plants. The author covers five thermal power cycles: organic Rankine cycle (ORC), organic flash cycle (OFC), Kalina cycle (KC), steam Rankine cycle (SRC) and steam flash cycle (SFC) with the working fluids of R123, R124, R134a, R245fa, R717 and R407C. The handbook helps the reader to understand the latest power plant technologies suitable for

utilizing the waste heat generated by thermal industrial processes. Key Features: - Comprehensive modeling, simulation, analysis and optimization of 5 power cycle types with different working fluids - Clear information about the processes and solutions of thermal power cycles to augment the power generation with improved energy conversion. - Simple, reader friendly presentation - bibliographic references after each chapter for further reading This handbook is suitable for engineering students in degree courses and professionals in training programs who require resources on advanced

thermal power plant operation and optimal waste heat recovery processes, respectively. It is also a handy reference for energy conversion efficiency in heat recovery power plants. The book is also of interest to any researchers interested in industrial applications of thermodynamic processes.

ECOS 2012 The 25th International Conference on Efficiency, Cost, Optimization and Simulation of Energy Conversion Systems and Processes (Perugia, June 26th-June 29th, 2012) - Umberto Desideri 2012

The 8-volume set contains the Proceedings of the

25th ECOS 2012 International Conference, Perugia, Italy, June 26th to June 29th, 2012.

ECOS is an acronym for Efficiency, Cost, Optimization and Simulation (of energy conversion systems and processes), summarizing the topics covered in ECOS: Thermodynamics, Heat and Mass Transfer, Exergy and Second Law Analysis, Process Integration and Heat Exchanger Networks, Fluid Dynamics and Power Plant Components, Fuel Cells, Simulation of Energy Conversion Systems, Renewable Energies, Thermo-Economic Analysis and Optimisation, Combustion, Chemical Reactors,

Carbon Capture and Sequestration, Building/Urban/Complex Energy Systems, Water Desalination and Use of Water Resources, Energy Systems- Environmental and Sustainability Issues, System Operation/ Control/Diagnosis and Prognosis, Industrial Ecology.

Application of Exergy - Tolga Taner 2018-06-06

The main scope of this study is to emphasize exergy efficiency in all fields of industry. The chapters collected in the book are contributed by invited researchers with a long-standing experience in different research areas. I hope that

the material presented here is understandable to a wide audience, not only energy engineers but also scientists from various disciplines. The book contains seven chapters in three sections: (1) "General Information about Exergy," (2) "Exergy Applications," and (3) "Thermoeconomic Analysis." This book provides detailed and up-to-date evaluations in different areas written by academics with experience in their fields. It is anticipated that this book will make a scientific contribution to exergy workers, researchers, academics, PhD students, and other scientists in both the present and the future.

Cogeneration and Polygeneration Systems - Majid Amidpour 2020-11-03

Cogeneration and Polygeneration Systems explores the suite of state-of-the-art modeling, design, analysis and optimization procedures for creating and retooling optimally efficient combined heat and power (CHP) and polygeneration energy systems. The book adopts exergetic and thermoeconomic analysis and related modeling and simulation tools to inform performance and systems design in modern cogeneration plants. Chapters provide a methodical approach to the design, operation and troubleshooting of

cogeneration systems when they are integrated with industrial processes. Cogeneration targets, environmental impacts, total site integration, and availability and reliability issues are addressed in-depth. Explores exergetic and exergoeconomic analysis for optimization purposes of CHP systems Addresses availability and reliability issues within cogeneration systems Reviews modern polygeneration systems based on renewable energy resources and fuel cells
MECHANICAL ENGINEERING, ENERGY SYSTEMS AND SUSTAINABLE DEVELOPMENT -Volume IV -
Konstantin V. Frolov 2009-04-15

Mechanical Engineering, Energy Systems and Sustainable Development theme is a component of Encyclopedia of Physical Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. The Theme on Mechanical Engineering, Energy Systems and Sustainable Development with contributions from distinguished experts in the field discusses mechanical engineering - the generation and application of heat and mechanical power and the design, production, and use of machines and

tools. These five volumes are aimed at the following five major target audiences: University and College Students Educators, Professional Practitioners, Research Personnel and Policy Analysts, Managers, and Decision Makers, NGOs and GOs.

Flexible Kalina Cycle Systems - Tangellapalli Srinivas 2019-03-07

This volume provides a good understanding of the binary fluid system, highlighting new dimensions of the existing Kalina cycle system, a thermodynamic process for converting thermal energy into usable mechanical power. The book

illustrates that providing new flexibility leads to new research outcomes and possible new projects in this field. The information provided in the book simplifies the application of the Kalina cycle system with an easy-to-understand and thorough explanation of properties development, processes solutions, sub-system work, and total system work. There are currently no books available in the area of binary fluid system in the field of KCS with added fallibility in the operation and process design. Currently decentralized power systems are gaining more attention due to shortages in power, and cooling demands are

competing with other electrical loads. This book fills a valuable information gap, providing insight into a new dimension for designers, practicing engineers, and academicians in this area.

Efficiency of Biomass Energy - Krzysztof J.

Ptasinski 2016-08-30

Details energy and exergy efficiencies of all major aspects of bioenergy systems Covers all major bioenergy processes starting from photosynthesis and cultivation of biomass feedstocks and ending with final bioenergy products, like power, biofuels, and chemicals Each chapter includes historical developments, chemistry, major technologies,

applications as well as energy, environmental and economic aspects in order to serve as an introduction to biomass and bioenergy A separate chapter introduces a beginner in easy accessible way to exergy analysis and the similarities and differences between energy and exergy efficiencies are underlined Includes case studies and illustrative examples of 1st, 2nd, and 3rd generation biofuels production, power and heat generation (thermal plants, fuel cells, boilers), and biorefineries Traditional fossil fuels-based technologies are also described in order to compare with the corresponding bioenergy

systems

Steam Power Engineering - Seikan Ishigai 1999

This 1999 book examines the important advances in steam power in the fifteen years leading up to its publication.

**Progress in Sustainable Energy Technologies:
Generating Renewable Energy** - Ibrahim Dincer
2014-10-29

This multi-disciplinary volume presents information on the state-of-the-art in sustainable energy technologies key to tackling the world's energy challenges and achieving environmentally benign solutions. Its unique amalgamation of the

latest technical information, research findings and examples of successfully applied new developments in the area of sustainable energy will be of keen interest to engineers, students, practitioners, scientists and researchers working with sustainable energy technologies. Problem statements, projections, new concepts, models, experiments, measurements and simulations from not only engineering and science, but disciplines as diverse as ecology, education, economics and information technology are included, in order to create a truly holistic vision of the sustainable energy field. The contributions feature coverage

of topics including solar and wind energy, biomass and biofuels, waste-to-energy, renewable fuels, geothermal and hydrogen power, efficiency gains in fossil fuels and energy storage technologies including batteries and fuel cells.

THERMAL POWER PLANT AND CO-GENERATION PLANNING - VoLUME III -
2010-10-05

These volumes are a component of Encyclopedia of Water Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. These

volumes discuss on Large-scale power production which requires the use of heat in a thermodynamic cycle to produce mechanical work, which in turn can generate electrical energy. Substantial quantities of fuel are hence required to sustain the production of heat. Fuel may be combustible, as in the case of fossil fuels such as coal and oil, or fissionable, as in the case of nuclear fuels such as uranium. All fuels produce waste products, which must be discharged, dumped, or stored. Such products range from innocuous water vapor to hazardous nuclear waste. These volumes are aimed at the

following five major target audiences: University and College Students Educators, Professional Practitioners, Research Personnel and Policy and Decision Makers

Progress in Exergy, Energy, and the Environment -
Ibrahim Dincer 2014-06-17

This thorough and highly relevant volume examines exergy, energy and the environment in the context of energy systems and applications and as a potential tool for design, analysis, optimization. It further considers their role in minimizing and/or eliminating environmental impacts and providing for sustainable

development. In this regard, several key topics ranging from the basics of the thermodynamic concepts to advanced exergy analysis techniques in a wide range of applications are covered.

Exergy - Ibrahim Dincer 2012-12-31

This book deals with exergy and its applications to various energy systems and applications as a potential tool for design, analysis and optimization, and its role in minimizing and/or eliminating environmental impacts and providing sustainable development. In this regard, several key topics ranging from the basics of the thermodynamic concepts to advanced exergy

analysis techniques in a wide range of applications are covered as outlined in the contents. Offers comprehensive coverage of exergy and its applications, along with the most up-to-date information in the area with recent developments Connects exergy with three essential areas in terms of energy, environment and sustainable development Provides a number of illustrative examples, practical applications, and case studies Written in an easy-to-follow style, starting from the basics to advanced systems
Gas Turbines for Electric Power Generation - S. Can Gülen 2019-02-14

Everything you wanted to know about industrial gas turbines for electric power generation in one source with hard-to-find, hands-on technical information.

Exergy for A Better Environment and Improved Sustainability 1 - Fethi Aloui 2018-08-04

This multi-disciplinary book presents the most recent advances in exergy, energy, and environmental issues. Volume 1 focuses on fundamentals in the field and covers current problems, future needs, and prospects in the area of energy and environment from researchers worldwide. Based on selected lectures from the

Seventh International Exergy, Energy and Environmental Symposium (IEEES7-2015) and complemented by further invited contributions, this comprehensive set of contributions promote the exchange of new ideas and techniques in energy conversion and conservation in order to exchange best practices in "energetic efficiency". Included are fundamental and historical coverage of the green transportation and sustainable mobility sectors, especially regarding the development of sustainable technologies for thermal comforts and green transportation vehicles. Furthermore, contributions on renewable

and sustainable energy sources, strategies for energy production, and the carbon-free society constitute an important part of this book. *Exergy for Better Environment and Sustainability, Volume 1* will appeal to researchers, students, and professionals within engineering and the renewable energy fields.

Optimization of Energy Systems - Ibrahim Dincer

2017-05-15

An essential resource for optimizing energy systems to enhance design capability, performance and sustainability *Optimization of Energy Systems* comprehensively describes the

thermodynamic modelling, analysis and optimization of numerous types of energy systems in various applications. It provides a new understanding of the system and the process of defining proper objective functions for determination of the most suitable design parameters for achieving enhanced efficiency, cost effectiveness and sustainability. Beginning with a general summary of thermodynamics, optimization techniques and optimization methods for thermal components, the book goes on to describe how to determine the most appropriate design parameters for more complex energy

systems using various optimization methods. The results of each chapter provide potential tools for design, analysis, performance improvement, and greenhouse gas emissions reduction. Key features: Comprehensive coverage of the modelling, analysis and optimization of many energy systems for a variety of applications. Examples, practical applications and case studies to put theory into practice. Study problems at the end of each chapter that foster critical thinking and skill development. Written in an easy-to-follow style, starting with simple systems and moving to advanced energy systems and their

complexities. A unique resource for understanding cutting-edge research in the thermodynamic analysis and optimization of a wide range of energy systems, Optimization of Energy Systems is suitable for graduate and senior undergraduate students, researchers, engineers, practitioners, and scientists in the area of energy systems.

Combined-cycle Gas & Steam Turbine Power Plants - Rolf Kehlhofer 1999

This title provides a reference on technical and economic factors of combined-cycle applications within the utility and cogeneration markets.

Kehlhofer - and his co-authors give the reader

tips on system layout, details on controls and automation, and operating instructions.

Thermodynamic Optimization of Complex Energy Systems - Adrian Bejan 2012-12-06

A comprehensive assessment of the methodologies of thermodynamic optimization, exergy analysis and thermoeconomics, and their application to the design of efficient and environmentally sound energy systems. The chapters are organized in a sequence that begins with pure thermodynamics and progresses towards the blending of thermodynamics with other disciplines, such as heat transfer and cost

accounting. Three methods of analysis stand out: entropy generation minimization, exergy (or availability) analysis, and thermoeconomics. The book reviews current directions in a field that is both extremely important and intellectually alive.

Additionally, new directions for research on thermodynamics and optimization are revealed.

Exergy, Energy System Analysis and Optimization - Volume III - Christos A. Frangopoulos
2009-05-13

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and Technology Resources which is part of the global Encyclopedia of Life Support Systems (EOLSS), an integrated compendium of twenty one Encyclopedias. These three volumes are organized into five different topics which represent the main scientific areas of the theme:

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The Exergy Method of Thermal Plant Analysis - T.

J. Kotas 2013-10-22

The Exergy Method of Thermal Plant Analysis aims to discuss the history, related concepts, applications, and development of the Exergy Method - analysis technique that uses the Second

Law of Thermodynamics as the basis of evaluation of thermodynamic loss. The book, after an introduction to thermodynamics and its related concepts, covers concepts related to exergy, such as physical and chemical exergy, exergy concepts for a control method and a closed-system analysis, the exergy analysis of simple processes, and the thermocentric applications of exergy. A seven-part appendix is also included. Appendices A-D covers miscellaneous information on exergy, and Appendix E features charts of thermodynamic properties. Appendix F is a glossary of terms, and Appendix G contains the

list of references. The text is recommended for physicists who would like to know more about the Exergy Method, its underlying principles, and its applications not only in thermal plant analysis but also in certain areas.

Applied Thermodynamics - KamW. Li 2018-05-04
Deals with the availability method and its application to power plant system design and energy conversion. The first part of the book describes the development and the formulation of the availability method. The second part presents its applications to energy conversion processes. Examples for each energy conversion system are

introduced and there are practice problems throughout the text.

Organic Rankine Cycle (ORC) Power Systems -

Ennio Macchi 2016-08-24

Organic Rankine Cycle (ORC) Power Systems: Technologies and Applications provides a systematic and detailed description of organic Rankine cycle technologies and the way they are increasingly of interest for cost-effective sustainable energy generation. Popular applications include cogeneration from biomass and electricity generation from geothermal reservoirs and concentrating solar power

installations, as well as waste heat recovery from gas turbines, internal combustion engines and medium- and low-temperature industrial processes. With hundreds of ORC power systems already in operation and the market growing at a fast pace, this is an active and engaging area of scientific research and technical development.

The book is structured in three main parts: (i) Introduction to ORC Power Systems, Design and Optimization, (ii) ORC Plant Components, and (iii) Fields of Application. Provides a thorough introduction to ORC power systems Contains detailed chapters on ORC plant components

Includes a section focusing on ORC design and optimization Reviews key applications of ORC technologies, including cogeneration from biomass, electricity generation from geothermal reservoirs and concentrating solar power installations, waste heat recovery from gas turbines, internal combustion engines and medium- and low-temperature industrial processes Various chapters are authored by well-known specialists from Academia and ORC manufacturers

Advanced Power Generation Systems - Ibrahim Dincer 2014-07-15

Advanced Power Generation Systems examines the full range of advanced multiple output thermodynamic cycles that can enable more sustainable and efficient power production from traditional methods, as well as driving the significant gains available from renewable sources. These advanced cycles can harness the by-products of one power generation effort, such as electricity production, to simultaneously create additional energy outputs, such as heat or refrigeration. Gas turbine-based, and industrial waste heat recovery-based combined, cogeneration, and trigeneration cycles are

considered in depth, along with Syngas combustion engines, hybrid SOFC/gas turbine engines, and other thermodynamically efficient and environmentally conscious generation technologies. The uses of solar power, biomass, hydrogen, and fuel cells in advanced power generation are considered, within both hybrid and dedicated systems. The detailed energy and exergy analysis of each type of system provided by globally recognized author Dr. Ibrahim Dincer will inform effective and efficient design choices, while emphasizing the pivotal role of new methodologies and models for performance

assessment of existing systems. This unique resource gathers information from thermodynamics, fluid mechanics, heat transfer, and energy system design to provide a single-source guide to solving practical power engineering problems. The only complete source of info on the whole array of multiple output thermodynamic cycles, covering all the design options for environmentally-conscious combined production of electric power, heat, and refrigeration Offers crucial instruction on realizing more efficiency in traditional power generation systems, and on implementing renewable

technologies, including solar, hydrogen, fuel cells, and biomass Each cycle description clarified through schematic diagrams, and linked to sustainable development scenarios through detailed energy, exergy, and efficiency analyses Case studies and examples demonstrate how novel systems and performance assessment methods function in practice

Applications of Machine Learning - Prashant Johri
2020-05-04

This book covers applications of machine learning in artificial intelligence. The specific topics covered include human language, heterogeneous

and streaming data, unmanned systems, neural information processing, marketing and the social sciences, bioinformatics and robotics, etc. It also provides a broad range of techniques that can be successfully applied and adopted in different areas. Accordingly, the book offers an interesting and insightful read for scholars in the areas of computer vision, speech recognition, healthcare, business, marketing, and bioinformatics.

Fundamentals of Engineering Thermodynamics - Michael J. Moran 2010-12-07

This leading text in the field maintains its engaging, readable style while presenting a

broader range of applications that motivate engineers to learn the core thermodynamics concepts. Two new coauthors help update the material and integrate engaging, new problems. Throughout the chapters, they focus on the relevance of thermodynamics to modern engineering problems. Many relevant engineering based situations are also presented to help engineers model and solve these problems.

Polygeneration Systems - Francesco Calise
2021-09-22

The support for polygeneration lies in the possibility of integrating different technologies into

a single energy system, to maximize the utilization of both fossil and renewable fuels. A system that delivers multiple forms of energy to users, maximizing the overall efficiency makes polygeneration an emerging and viable option for energy consuming industries. *Polygeneration Systems: Design, Processes and Technologies* provides simple and advanced calculation techniques to evaluate energy, environmental and economic performance of polygeneration systems under analysis. With specific design guidelines for each type of polygeneration system and experimental performance data, referred both to

single components and overall systems, this title covers all aspects of polygeneration from design to operation, optimization and practical implementation. Giving different aspects of both fossil and non-fossil fuel based polygeneration and the wider area of polygeneration processes, this book helps readers learn general principles to specific system design and development through analysis of case studies, examples, simulation characteristics and thermodynamic and economic data. Detailed economic data for technology to assist developing feasibility studies regarding the possible application of polygeneration

technologies Offers a comprehensive list of all current numerical and experimental results of polygeneration available Includes simulation models, cost figures, demonstration projects and test standards for designers and researchers to validate their own models and/or to test the reliability of their results

Scientific and Technical Aerospace Reports - 1994

Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical

Information Database.

Exergy Analysis for Energy Conversion Systems -

Efstathios Michaelides 2021-01-31

Discover a straightforward and holistic look at energy conversion and conservation processes using the exergy concept with this thorough text.

Explains the fundamental energy conversion processes in numerous diverse systems, ranging from jet engines and nuclear reactors to human bodies. Provides examples for applications to practical energy conversion processes and systems that use our naturally occurring energy

resources, such as fossil fuels, solar energy, wind, geothermal, and nuclear fuels. With more than one-hundred diverse cases and solved examples, readers will be able to perform optimizations for a cleaner environment, a sustainable energy future, and affordable energy generation. An essential tool for practicing scientists and engineers who work or do research in the area of energy and exergy, as well as graduate students and faculty in chemical engineering, mechanical engineering and physics.