

1. Record Nr.	UNINA9910457217603321
Titolo	Advances in combustion science [[electronic resource] ] : in honor of Ya. B. Zel'dovich / / edited by William A. Sirignano, Alexander G. Merzhanov, Luigi De Luca
Pubbl/distr/stampa	Reston, Va., : American Institute of Aeronautics and Astronautics, Inc., 1997
ISBN	1-60086-645-X 1-60086-426-0
Descrizione fisica	1 online resource (374 p.)
Collana	Progress in astronautics and aeronautics ; ; v. 173
Altri autori (Persone)	LucaLuigi De MerzhanovAleksandr Grigorevich SirignanoW. A ZeldovichIA. B (IAkov Borisovich)
Disciplina	629.47
Soggetti	Combustion Combustion engineering Electronic books.
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 index.
Nota di contenuto	""Cover""; ""Title""; ""Copyright""; ""Table of Contents""; ""Preface""; ""Biography""; ""I. Flame Theory""; ""Chapter 1 Zel'dovich's Accomplishments in Combustion Science""; ""Chapter 2 Combustion Theory in the Post-Zel'dovich Period""; ""Chapter 3 Nonequilibrium Theory of Flame Propagation""; ""Chapter 4 Triple Flames as Agents for Restructuring of Diffusion Flames""; ""Chapter 5 Kinetic Foundation of Thermal Flame Theory""; ""II. Heterogeneous Combustion""; ""Chapter 6 Filtration Combustion""; ""Chapter 7 Metal Slurry Droplet and Spray Combustion"" ""Chapter 8 Flame Spread Across Condensed Combustibles""""Chapter 9 Phenomenon of Nonthermal Propagation of Flameand Nonlinear Chain Branching""; ""III. Unsteady and Cellular Combustion""; ""Chapter 10 Cellular Flame Patterns and Dynamics""; ""Chapter 11 Numerical Simulation of Unsteady Combustion""; ""Color Plates""; ""Chapter 12 Intrinsic Stability of Energetic Solids Burning under Thermal Radiation"";

""IV. Turbulent Combustion""; ""Chapter 13 Turbulent Combustion Modeling: Ignition and Initial Period of Propagation""  
 ""Chapter 14 Flame Curvature as a Determinant of Preferential Diffusion Effects in Premixed Turbulent Combustion""""Chapter 15 Gasdynamic Model of Turbulent Exothermic Fields in Explosions""; ""Color Plates""; ""Chapter 16 Combustion Theory and Conditional Moment Closure Modeling""; ""V. Explosions and Detonations""; ""Chapter 17 Nonequilibrium Phenomena in Combustion and Explosion""; ""Chapter 18 Initiation of Detonation by a Hypervelocity Projectile""; ""Chapter 19 Theory of Gaseous Detonations""; ""Chapter 20 Modern View of Gas Detonation Mechanisms""  
 ""Chapter 21 Zel'dovich Theory of Detonability Limits""""Author Index""

2. Record Nr.	UNINA9911019870203321
Autore	Sagar Shrddha
Titolo	Cyber Physical Energy Systems
Pubbl/distr/stampa	Newark : , : John Wiley & Sons, Incorporated, , 2025 ©2024
ISBN	9781394173006 1394173008 9781394172986 1394172982 9781394172993 1394172990
Edizione	[1st ed.]
Descrizione fisica	1 online resource (564 pages)
Altri autori (Persone)	PoongodiT DhanarajRajesh Kumar SanjeevikumarPadmanaban <1978->
Disciplina	621.31
Soggetti	Microgrids (Smart power grids) - Security measures
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Series Page -- Title Page -- Copyright Page -- Contents -- Preface -- Chapter 1 Cyber-Physical Systems: A Control and Energy

Approach -- 1.1 Introduction -- 1.1.1 Background and Motivation -- 1.1.2 Testbeds, Revisions, and a Safety Study for Cyber-Physical Energy Systems -- 1.1.3 CPES Test Chamber -- 1.1.4 Significance and Contributions of Testbed -- 1.1.5 Testbed Setup -- 1.1.6 Illustration of Hybrid CPES Testbed Structure -- 1.2 Studies on CPES Safety -- 1.2.1 Attacks in the CPES System -- 1.2.2 Evaluation of Attack Impacts on CPES -- 1.2.3 CPES's Assault Detection Algorithms -- 1.2.4 CPES's Assault Mitigation and Defense Systems -- 1.2.5 Dangerous Imagery -- 1.2.6 Attack Database -- 1.3 Threat Evaluation -- 1.4 Theory of Cyber-Physical Systems Risk -- 1.4.1 Challenger Type -- 1.4.2 Attack Type -- 1.5 Threat Evaluation Methodology -- 1.5.1 Cyber-System Layer -- 1.5.2 Physical-System Layer -- 1.6 Experimental Setup for Cross-Layer Firmware Threats -- 1.6.1 Risk Model -- 1.6.2 Threat Evaluation -- 1.7 Conclusion -- References -- Chapter 2 Optimization Techniques for Energy Management in Microgrid -- 2.1 Introduction -- 2.1.1 Microgrid Systems -- 2.1.2 Energy Management System -- 2.1.3 Energy Management of Distribution System -- 2.1.4 Techniques to Take Into Account While Implementing the EMS -- 2.1.5 Strategies for Reducing Risk -- 2.1.6 Monitoring Power Systems -- 2.1.7 Demand Response, Price Strategy, and Demand Side Management -- 2.2 Explanation Methods for EMS -- 2.3 EQN EMS on an Arithmetic Optimization Basis -- 2.4 Heuristic-Oriented Methods to EMS Problem-Solving -- 2.5 EMS Solution Techniques Using Meta-Heuristics -- 2.6 Alternative EMS Implementation Strategies -- 2.6.1 SCADA System -- 2.7 Conclusion and Viewpoints -- References -- Chapter 3 Cyber-Physical Energy Systems for Smart Grid: Reliable Distribution -- 3.1 Introduction. 3.1.1 Need for Sustainable and Efficient Power Generation Through Smart Grid Technology and Cyber-Physical Technologies -- 3.1.2 CPES: The Integration of Physical and Digital Worlds -- 3.2 Cyber-Physical Energy Systems (CPES) -- 3.3 Forming Energy Systems -- 3.4 Energy Efficiency -- 3.4.1 CPES Usage on Smart Grids -- 3.5 Smart Grids -- 3.6 Cyber-Physical Systems -- 3.7 SG: A CPS Viewpoint -- 3.7.1 Challenges and Solutions for Coordinating Smart Grids and Cyber-Physical Systems -- 3.7.2 Techniques of Correspondence -- 3.7.3 Data Protection -- 3.7.4 Data Skill and Engineering -- 3.7.5 Distributed Computation -- 3.7.6 Distributed Intellect -- 3.7.7 Distributed Optimization -- 3.7.8 Distributed Controller -- 3.8 Upcoming Prospects and Contexts -- 3.8.1 Big Data -- 3.8.2 Cloud Computing -- 3.8.3 IoT -- 3.8.4 Network Science -- 3.8.5 Regulation and Guidelines -- 3.9 Conclusion -- References -- Chapter 4 Evolution of AI in CPS: Enhancing Technical Capabilities and Human Interactions -- 4.1 Introduction to Cyber-Physical System -- 4.2 The Cyber-Physical Systems Architecture -- 4.2.1 5C Architecture or CPS -- 4.2.1.1 Connection -- 4.2.1.2 Conversion -- 4.2.1.3 Cyber -- 4.2.1.4 Knowledge -- 4.2.1.5 Configuration -- 4.3 Cyber-Physical Systems as Real-Time Applications -- 4.3.1 Robotics Distributed -- 4.3.2 Manufacturing -- 4.3.3 Distribution of Water -- 4.3.4 Smart Greenhouses -- 4.3.5 Healthcare -- 4.3.6 Transportation -- 4.4 Impact of AI on Cyber-Physical Systems -- 4.5 Policies -- 4.6 Expected Benefits and Core Promises -- 4.7 Unintended Consequences and Implications for Policy -- 4.7.1 Negative Social Impacts -- 4.7.2 Cybersecurity Risks -- 4.7.3 Impact on the Environment -- 4.7.4 Ethical Issues -- 4.7.5 Policy Implications -- 4.8 Employment and Delegation of Tasks -- 4.9 Safety, Responsibility, and Liability -- 4.10 Privacy Concerns. 4.10.1 Data Collection and Use -- 4.10.2 Data Security -- 4.10.3 Data Sharing -- 4.10.4 Bias and Discrimination -- 4.10.5 User Empowerment -- 4.11 Social Relations -- 4.11.1 Cyber-Physical

Systems and Transport -- 4.11.2 Trade of Dual-Use Technology -- 4.11.3 Civil Liberties (Data Protection, Privacy, etc.) -- 4.11.4 Safety (Such as Risk Analysis, Product Safety, etc.) -- 4.11.5 Healthcare (Medical Devices, Clinical Trials, and E-Health Devices) -- 4.11.6 Energy and Environment -- 4.11.7 Horizontal Legal Issues (Cross-Committee Considerations) -- 4.12 Economic Study on CPS -- 4.12.1 Better Resource Allocation -- 4.12.2 Enhanced Marketability -- 4.12.3 Robustness and Resilience -- 4.12.4 Regulatory Compliance -- 4.12.5 Making Decisions in Real-Time -- 4.13 Case Studies -- 4.13.1 The Daily Lives of Older Persons and Disabled Individuals with CPS -- 4.13.2 CPS in Healthcare -- 4.13.3 CPS for Security and Safety -- 4.14 Conclusion -- References -- Chapter 5 IoT Technology Enables Sophisticated Energy Management in Smart Factory -- 5.1 Introduction -- 5.2 IOT Overview -- 5.2.1 The Evolution of the Internet -- 5.2.2 IoT Sensing -- 5.2.3 IOT Data Protocol and Architecture -- 5.3 IOT Enabling Technology -- 5.3.1 Application Domain -- 5.3.2 Middleware Domain -- 5.3.3 Network Domain -- 5.3.4 Object Domain -- 5.4 IOT in Energy Sector -- 5.4.1 Internet of Things and Energy Generation -- 5.5 Challenges of Applying IOT -- 5.6 Reference Architecture for IoT-Based Smart Factory -- 5.7 Characteristics of Smart Factory -- 5.8 Challenges for IoT-Based Smart Industry -- 5.9 How IoT Will Support Energy Management in Smart Factory -- 5.10 IoT Energy Management Architecture for Industrial Applications -- 5.10.1 IoT-Based Energy Management Technology -- 5.10.2 Energy Harvesting -- 5.11 Case Study: Smart Factory -- 5.11.1 Supply Side -- 5.11.2 Photovoltaic Power Generation. 5.11.3 Smart Micro-Grid -- 5.11.4 Demand Side -- 5.11.5 Virtualization -- 5.12 Conclusion -- References -- Chapter 6 IOT-Based Advanced Energy Management in Smart Factories -- 6.1 Introduction -- 6.2 Smart Factory Benefits of IOT-Based Advanced Energy Management -- 6.3 Role of IOT Technology in Energy Management -- 6.4 Developing an IOT Information Model for Energy Efficiency -- 6.5 Integrating Intelligent Energy Systems (IES) and Demand Response (DR) -- 6.6 How to Accurately Measure and Manage Your Energy Usage -- 6.7 Introduction to Energy Efficiency Measures -- 6.8 Identifying Opportunities to Reduce Energy Use -- 6.9 Monitoring and Measuring Energy Usage -- 6.10 Establishing Accounting and Incentives -- 6.11 Sustaining the Long-Term Benefits of Optimized Energy Usage -- 6.12 Role of Cyber Security When Implementing IoT-Based Advanced Energy Solutions -- 6.13 Materials Required in Smart Factories -- 6.14 Methods in IoT-Based Smart Factory Implementation -- 6.15 Steps for Developing an IoT-Based Energy Management System -- 6.15.1 Assess Current Energy Usage -- 6.15.2 Develop an Energy Conservation Plan -- 6.15.3 Implement IoT Technology -- 6.15.4 Monitor Results -- 6.16 Challenges For Adopting IoT-Based Energy Management Systems -- 6.16.1 Big Data and Analytics -- 6.16.2 Connectivity Constraints -- 6.16.3 Data Security and Privacy Issues -- 6.16.4 Device Troubleshooting -- 6.17 Recommendations for Overcoming the Challenges With Implementing IoT-Based Advanced Energy Solution -- 6.17.1 IoT-Enabled Automation -- 6.17.2 Smart Sensors -- 6.17.3 Predictive Analytics -- 6.18 Case Studies -- 6.18.1 Automated Demand Response (ADR) -- 6.18.2 Automated Maintenance -- 6.18.3 Predictive Analytics -- 6.19 Case Studies for Successful Implementation -- 6.20 Applications -- 6.21 Different Techniques for Monitoring and Control of IoT Devices. 6.22 Literature Survey -- 6.23 Conclusion -- References -- Chapter 7 Challenges in Ensuring Security for Smart Energy Management Chapter Systems Based on CPS -- 7.1 Introduction -- 7.1.1 Brief Overview of

Smart Energy Management Systems and Cyber-Physical Systems --  
7.1.2 Importance of Security in CPS-Based Smart Energy Management --  
7.2 Cyber-Physical Systems and Smart Energy Management -- 7.2.1  
CPS Architecture and Components -- 7.2.2 Types of CPS-Based Smart  
Energy Management Systems -- 7.2.3 Common Communication  
Protocols Used in CPS-Based Smart Energy Management -- 7.2.4 Cyber  
Security Threats in CPS-Based Systems -- 7.3 Security Challenges in  
CPS-Based Smart Energy Management -- 7.3.1 Cyber Security Threats  
to CPS-Based Smart Energy Management Systems -- 7.3.2  
Vulnerabilities of Communication Protocols Used in Smart Energy  
Management -- 7.3.3 Attack Vectors for Compromising CPS-Based  
Smart Energy Management Systems -- 7.4 Cyber Security Standards  
and Guidelines for Smart Energy Management -- 7.4.1 Cyber Security  
Incidents in Smart Energy Management -- 7.5 Conclusion --  
References -- Chapter 8 Security Challenges in CPS-Based Smart  
Energy Management -- 8.1 Introduction -- 8.2 CPS Architecture -- 8.3  
The Driving Forces for CPS -- 8.3.1 Big Data -- 8.3.2 Cloud -- 8.3.3  
Machine-to-Machine Communication and Wireless Sensor Networks --  
8.3.4 Mechatronics -- 8.3.5 Cybernetics -- 8.3.6 Systems of Systems  
-- 8.4 Advances in Cyber-Physical Systems -- 8.4.1 Application  
Domains of CPS -- 8.4.1.1 Industrial Transformation -- 8.4.1.2 Smart  
Grid -- 8.4.1.3 Healthcare -- 8.4.1.4 Smart Parking System -- 8.4.1.5  
Household CPS -- 8.4.1.6 Aerospace -- 8.4.1.7 Agriculture -- 8.4.1.8  
Construction -- 8.5 Energy Management through CPS -- 8.5.1 Energy  
Management of CPS for Smart Grid -- 8.5.2 Energy Management of CPS  
for Smart Building Structure.  
8.5.3 Energy Management of CPS for Autonomous Electric Vehicles in  
Smart Transportation.

---

## Sommario/riassunto

This book is essential for understanding the transformative integration of cyber-physical systems in smart grids, providing valuable insights that will shape the future of sustainable energy production and distribution. A novel modeling methodology that blends cyber and physical components is a significant advancement for future energy systems. A Cyber-Physical System (CPS) is an integrated component of physical microgrids that combines computers, wireless connections, and controls to create a holistic solution. As a result of cyber-physical systems, a new generation of engineering systems incorporating wireless communication has begun to emerge. Despite that there are various major CPS systems in use today, one of the most challenging sectors for implementation is the smart grid which aims to distribute dependable and efficient electric energy while maintaining a high level of global environmental sustainability. Smart grids incorporate advanced monitoring to ensure a secure, efficient energy supply, enhancing generator and distributor performance while offering consumers more choices. These systems aim to boost the capacity and responsiveness of energy production, transmission, distribution, and consumption. As renewable energy sources grow, traditional methods are being challenged, requiring cross-domain integration of energy systems and data. This book explores architectures and methods for integrating cutting-edge technology into the power grid for more sustainable energy production and distribution.

---