International Journal of Smart Grid (IJSmartGrid)
https://www.ijsmartgrid.org/ Online ISSN: 2602-439X

About IJSG

International Journal of Smart Grid (IJSG) is a peer-reviewed, open-access journal publishing high-quality research in smart grid technologies and applications. It provides a platform for researchers, academicians, and industry professionals to present innovative studies related to modern power systems, smart energy solutions, and grid digitalization.

Aims

IJSG aims to promote advanced research in smart grid systems, encourage interdisciplinary collaboration, and support sustainable, efficient, and intelligent energy solutions worldwide.

Scope

The journal covers a broad range of topics related to smart grids, including but not limited to smart energy systems, renewable energy integration, energy storage technologies, power electronics, grid automation, and intelligent control systems.

Topics of Interest

Smart Grid Technologies & Applications

Renewable Energy Systems (Solar, Wind, Hybrid Systems)

Energy Storage Systems & Battery Technologies

Power Electronics & Electric Drives

Smart Metering & Advanced Metering Infrastructure (AMI)

Microgrids & Distributed Generation

Electric Vehicles & Charging Infrastructure

Energy Management Systems & Optimization

Artificial Intelligence in Energy Systems

Cybersecurity in Smart Grids

Audience

IJSG targets researchers, engineers, academicians, policymakers, and industry professionals working in smart grids, energy systems, and related technologies.

International Journal of Smart Grid (IJSmartGrid)
https://www.ijsmartgrid.org/ Online ISSN: 2602-439X

Peer Review Policy

IJSG follows a double-blind peer review process to ensure objective and unbiased evaluation All submissions are reviewed by independent experts in the relevant field to maintain scientific quality.

Publication Ethics

IJSG adheres to international publication ethics standards, including COPE guidelines. Authors, reviewers, and editors must follow principles of integrity, transparency, and confidentiality.

Open Access Policy

IJSG is an open-access journal, providing free and unrestricted access to all published content. Readers can read, download, and share articles without any subscription or access fee.

Copyright and Licensing

All published articles are licensed under Creative Commons (CC BY 4.0). Authors retain copyright while allowing unrestricted use with proper citation.

Plagiarism and Similarity Check

All submissions are checked using plagiarism detection tools (e.g., iThenticate). Papers with high similarity rates are rejected or returned for revision.

Publication Fees

IJSG is an open-access journal. There is no submission fee, review fee, or publication fee (no APC) for authors.

International Journal of Smart Grid (IJSmartGrid)
https://www.ijsmartgrid.org/ Online ISSN: 2602-439X

Editor-in-Chief

Professor Erdal Bekiroglu, Gazi University, Turkey

Associate Editors (Section Editors)

Professor Fujio Kurokawa, Nagasaki Institute of Applied Science, Japan

Professor Jaeho Choi, Chungbuk National University, South Korea

Professor Sheldon Williamson, Ontario Tech University, Canada

Professor Joao Martins, Universidade Nova de Lisboa, Portugal

Professor Jian-Xin Shen, Zhejiang University, China

Professor Inno Ewean Davidson, Cape Peninsula University of Technology, South Africa

Professor Ramazan BAYINDIR, Gazi University, Turkey

Professor Dan M. Ionel, University of Kentucky, United States

Professor Ishwar Sethi, Oakland University, United States

Professor Miguel A. Sanz - Bobi, Comillas Pontifical University, Spain

Professor Massimo Caruso, Palermo University, Italy

Professor Jen-Hao Teng, National Sun Yat-sen University, Taiwan

Dr. Wahiba Yaici, Natural Resources Canada / CanmetENERGY Research Centre, Canada

Dr. Nahla Bouaziz, University of Tunis El Manar, Tunisia

Dr. Eklas Hossain, Oregon Tech., United States

Dr. Mahamadou Abdou Tankari, UPEC Paris, France

Dr. Giuseppe Schettino, University of Palermo, Italy

Dr. Robert M. Cuzner, University of Wisconsin-Milwaukee, United States

Dr. Claudio Nevoloso, University of Palermo, Italy

Smart Grid Section Editors

Professor Sheldon Williamson, Ontario Tech University, Canada

Professor Joao Martins, Universidade Nova de Lisboa, Portugal

Professor Massimo Caruso, Palermo University, Italy

Professor Jaeho Choi, Chungbuk National University, South Korea

International Journal of Smart Grid (IJSmartGrid)
https://www.ijsmartgrid.org/ Online ISSN: 2602-439X

Professor Erdal Irmak, Gazi University, Turkey

Professor Jen-Hao Teng, National Sun Yat-sen University, Taiwan

Dr. Wahiba Yaici, CanmetENERGY Research Centre Natural Resources Canada, Canada

Renewable Energy Section Editors

Professor Dan M. Ionel, University of Kentucky, United States

Professor Miguel A. Sanz - Bobi, Comillas Pontifical University, Spain

Professor Inno Ewean Davidson, Cape Peninsula University of Technology, South Africa

Dr. Eklas Hossain, Oregon Tech., United States

Dr. Giuseppe Schettino, University of Palermo, Italy

Dr. Nahla Bouaziz, University of Tunis El Manar, Tunisia

Power Electronics and Control Section Editors

Professor Fujio Kurokawa, Nagasaki Institute of Applied Science, Japan

Professor Jian-Xin Shen, Zhejiang University, China

Dr. Robert M. Cuzner, University of Wisconsin-Milwaukee, United States

Dr. Claudio Nevoloso, University of Palermo, Italy

Professor Korhan KAYISLI, Gazi University, Turkey

Machine Learning Section Editors

Professor Seref SAGIROGLU, Gazi University, Turkey

Professor M. Arif Wani, University of Kashmir, United States

Professor Onder EYECIOGLU, Banat Izzet Baysal Uni., Turkey

Professor Ishwar Sethi, Oakland University, United States

Dr. Uraz Yavanoglu, Gazi University, Turkey

Copyeditors

Professor Rosario Miceli, Palermo University, Italy

Dr. Mahamadou Abdou Tankari, UPEC Paris, France

International Journal of Smart Grid (IJSmartGrid)
https://www.ijsmartgrid.org/ Online ISSN: 2602-439X

Proofreaders

Professor Adel Nasiri, University of South Carolina, United States

Dr. Abdelkader Harrouz, University of Ahmed Draia, Algeria

Layout Editors

Professor Vitor Pires, Instituto Politecnico de Setubal, Portugal

Dr. Eklas Hossain, Oregon Tech., United States

Language Editors

Professor Mamadou Lamine Doumbia, University of Quebec at Trois-Rivieres, Canada

Professor Nagi Fahmi, Aston University, United Kingdom

Professor Khaled Ahmed, Strathclyde University, United Kingdom

Professor Viladimir A. Katic, University of Novi Sad Faculty of Technical Sciences, Serbia

Editorial Board

Professor Fujio Kurokawa, Nagasaki Institute of Applied Science, Japan

Professor Adel Nasiri, University of South Carolina, United States

Professor ilhami COLAK, Istinye University, Turkey

Professor Frede Blaabjerg, Aalborg University, Denmark

Professor Leopoldo Garcia Franquelo, Universidad de Sevilla, Spain

Professor Dan M. Ionel, University of Kentucky, United States

Professor Rosario Miceli, Palermo University, Italy

Professor Brayima Dakyo, University du Havre, France

Professor Inno Ewean Davidson, Cape Peninsula University of Technology, South Africa

Professor Pierluigi SIANO, University of Salerno, Italy

Professor Jaeho Choi, Chungbuk National University, South Korea

Professor Carlo Cecati, University of L'Aquila, Italy

Professor Jian-Xin Shen, Zhejiang University, China

Professor Kenneth Okedu, University of Port Harcourt, Oman

International Journal of Smart Grid (IJSmartGrid)
https://www.ijsmartgrid.org/ Online ISSN: 2602-439X

Professor Nobumasa Matsui, Nagasaki Institute of Applied Science, Japan

Professor Joao Martins, Universidade Nova de Lisboa, Portugal

Professor Nagi Fahmi, Aston University, United Kingdom

Professor Sudhakar Babu Thanikanti, Chaitanya Bharathi Institute of Technology

Professor Mamadou Lamine Doumbia, University of Quebec at Trois-Rivieres, Canada

Professor Fabio Viola, Palermo University, Italy

Professor Youcef Soufi, University Larbi Tebessi – Tebessa, Algeria

Professor Haruhi Eto, Nagasaki Institute of Applied Science, Japan

Professor Concettina Buceella, Lâ€™Aquila, Italy

Professor Viladimir A. Katic, University of Novi Sad Faculty of Technical Sciences, Serbia

Professor Constantin Filote, University of Suceava, Romania

Professor Miguel A. Sanz - Bobi, Comillas Pontifical University, Spain

Professor Massimo Caruso, Palermo University, Italy

Professor Athanasios N. Safacas, University of Patras, Greece

Professor Tadashi Suetsugu, Fukuoka University, Japan

Professor Mohamed Taha, Rafik Hariri University, Lebanon

Professor Vitor Pires, Instituto Politecnico de Setubal, Portugal

Professor Chan-Ki Kim, Pusan National University, South Korea

Professor Slobodan Mircevski, Ss. Cyril and Methodius Univ., Macadonia

Professor Andres Annuk, Estonian University of Life Science, Estonia

Professor Goce Arsov, Ss. Cyril and Methodius University, Macadonia

Professor Zdenek Cerovsky, Technical University of Prague, Czech Republic

Professor Bakhyt Matkarimov, Nazarbayev University, Kazakhstan

Professor Marija Mirosevic, University of Dubrovnik, Croatia

Professor Javier Bilbao, University of Basque Country, Spain

Dr. Wenlong Ming, Cardiff University, United Kingdom

International Journal of Smart Grid (IJSmartGrid)
https://www.ijsmartgrid.org/ Online ISSN: 2602-439X

CONTENTS

Research Articles

159 **Genetic Algorithm Optimized Fractional Order PI Controller for Enhanced Performance in a Grid-Connected PV System**

Metatla Samir, Soufi Youcef, Almaktoof Ali, Bendakir Abdelhakim

173 **A Novel Hybrid Expert System for Encryption Detection in Smart Grid and Mobile Storage Devices**

Ivan Opirskyy, Oleh Harasymchyk, Leila Rzayeva, Bayandy Sarsembayev, Murat Zhakenov, Kassimova Botakoz, Korhan Kayisli

191 **Accelerating Solar Panel Snow Detection: CPU vs. GPU Training Performance of VGG-19 and ResNet-50**

Önder Eyecioglu, Batuhan Hangun, Abdulkadir Turkan

209 **Optimal PMU Placement Techniques: A Detailed Review and Case Study on the Indian Utility 62 Bus System**

Nisha Sharma, Nisha Sharma, Priti Prabhakar, Avneesh Verma

Review Article

225 **A Multi-Layer Conceptual Security Architecture Toward Robust and Resilient SDN-Enabled Smart Grids**

Seref Sagiroglu, Mehmet Demirci, Yilmaz Atay, Murat Dener, M. Sedef Demirci, Ali Kara, Samed Al, Selcuk Yilmaz