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Editorial

Optimization Methods Applied to Power Systems

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1. Introduction

Continuous advances in computer hardware and software are enabling researchers to address optimization solutions using computational resources, as can be seen in the large number of optimization approaches that have been applied to the energy field.

Power systems are made up of extensive complex networks governed by physical laws in which unexpected and uncontrolled events can occur. This complexity has increased considerably in recent years due to the increase in distributed generation associated with increased generation capacity from renewable energy sources. Therefore, the analysis, design, and operation of current and future electrical systems require an efficient approach to different problems (like load flow, parameters and position finding, filter design, fault location, contingency analysis, system restoration after blackout, islanding detection of distributed generation, economic dispatch, unit commitment, etc.). Given the complexity of these problems, the efficient management of electrical systems requires the application of advanced optimization methods that take advantage of high-performance computer clusters.

This special issue belongs to the section "Electrical Power and Energy System". The topics of interest in this special issue include different optimization methods applied to any field related to power systems, such as conventional and renewable energy generation, distributed generation, transport and distribution of electrical energy, electrical machines and power electronics, intelligent systems, advances in electric mobility, etc. The optimization methods of interest for publication include, but are not limited to:

- Expert Systems
- Artificial Neural Networks
- Fuzzy Logic
- Genetic Algorithms
- Evolutionary Algorithms
- Simulated Annealing
- Tabu Search
- Ant Colony Optimization
- Particle Swarm Optimization
- Multi-Objective Optimization
- Parallel Computing
- Linear and Nonlinear Programming
- Integer and Mixed-Integer Programming
- Dynamic Programming
- Interior Point Methods
- Lagrangian Relaxation and Benders Decomposition-Based Methods
- General Stochastic Techniques.

2. Statistics of the Special Issue

The statistics of the call for papers for this special issue related to published or rejected items were: Total submissions (113), published (36; 31.8%), and rejected (77; 68.3%).

The authors' geographical distribution by countries for published papers is shown in Table 1, where it is possible to observe 144 authors from 19 different countries. Note that it is usual for an article to be signed by more than one author, and for authors to collaborate with others of different affiliation.

Table 1. Geographic distribution by countries of authors.

Country	Number of Authors
China	80
Spain	11
South Korea	9
Cameroon	5
Malaysia	5
United States	5
Taiwan	4
Thailand	4
Viet Nam	4
Brazil	3
Egypt	3
Algeria	2
France	2
Russian Federation	2
Chile	1
Germany	1
Mexico	1
New Zealand	1
Singapore	1
Total	**144**

3. Authors of this Special Issue

The authors of this special issue and their main bibliometric indicators are summarized in Table 2, where they have been ordered from the highest to the lowest H-index. The novel authors, those considered with an H-index equal to zero are 29, and those of H-index equal to 1 are 27. On the other hand, the internationally recognized authors, those considered with an H-index of 10 or higher, are 31. It is remarkable that these authors (H-index ≥10), on average, have more than 123 co-authors, more than 110 documents published, and more than 1069 citations.

Table 2. Affiliations and bibliometric indicators for the authors.

Author	Affiliation
Jurado F.	Universidad de Jaen
Watson N.	University of Canterbury
Trentesaux D.	University of Valenciennes et du Hainaut-Cambresis
Liu N.	North China Electric Power University
Premrudeepreechacharn S.	Chiang Mai University
Sun Y.	Hohai University
Gu W.	Southeast University
Aguado, J.A.	Universidad de Málaga
Baños R.	Universidad de Almeria
Montoya F.	Universidad de Almeria
Maciel P.	Universidade Federal de Pernambuco
Liu M.	South China University of Technology
Zhang C.	Shandong University
Liu Z.	North China Electric Power University

Table 2. *Cont.*

Author	Affiliation
Wu Z.	Southeast University
Miao S.	Huazhong University of Science and Technology
Yu J.	Chongqing University
Ferreira J.	Universidade de Pernambuco
Won D.	Inha University, Incheon
Bai L.	The University of North Carolina at Charlotte
Hu Y.	Hohai University
Yao L.	National Taipei University of Technology
Lim W.	UCSI University
Yang F.	Chongqing University
Sun H.	Hebei University of Technology
Callou G.	Universidade Federal Rural de Pernambuco
Lee J.	University of Louisiana at Lafayette
Zhao D.	North China Electric Power University
Zhang X.	Shantou University
Li Y.	Zhejiang University City College
Gutiérrez-Alcaraz G.	Tecnológico Nacional de México / I.T.
Huang N.	Northeast Electric Power University
Xiang J.	Zhejiang University
Morshed M.	University of Louisiana at Lafayette
Sun B.	Shandong University
Bekrar A.	University of Valenciennes et du Hainaut-Cambresis
Rhee S.	Yeungnam University
Kamel S.	Aswan University
Xie M.	South China University of Technology
Tutsch D.	Bergische Universitat Wuppertal
Sidorov D.	Melentiev Energy Systems Institute of Siberian Branch of the Russian Academy of Sciences
Zhang X.	Nanyang Technological University
Zhou B.	China Southern Power Grid
Perng J.	National Sun Yat-Sen University Taiwan
Panasetsky D.	Melentiev Energy Systems Institute of Siberian Branch of the Russian Academy of Sciences
Zheng T.	Tsinghua University
Li J.	Northeast China Institute of Electric Power Engineering
Hinojosa V.	Universidad Técnica Federico Santa María
Siritaratiwat A.	Khon Kaen University
Hua D.	South China University of Technology
Hamouda A.	Université Ferhat Abbas de Sétif
Zhang L.	Tianjin University of Commerce
Alcayde A.	Universidad de Almeria
Ge W.	State Grid Liaoning Electric Power Supply Co., Ltd.
Zhang L.	Chongqing University
Zhang C.	Hunan University
Wu J.	Beihang University
Wang Y.	North China Electric Power University
Febrero-Garrido L.	Defense University Center
Chambers T.	University of Louisiana at Lafayette
Truong A.	HCMC University of Technology and Education
Nganhou J.	University of Yaoundé
Li Y.	Huazhong University of Science and Technology
Lin L.	Jilin Institute of Chemical Technology
Jiang T.	North China Electric Power University
Ebeed M.	Sohag University
Chatthaworn R.	Khon Kaen University
Duong T.	Industrial University of Ho Chi Minh City
Hamandjoda O.	University of Yaoundé

Table 2. *Cont.*

Author	Affiliation
Chun Y.	Hongik University
Ye C.	Huazhong University of Science and Technology
Mei S.	Qinghai University
Nguyen T.	Industrial University of Ho Chi Minh City
Mao T.	China Southern Power Grid
Wang Y.	Hohai University
Arrabal-Campos F.	Universidad de Almeria
Tiang S.	UCSI University
Hmida J.	University of Louisiana at Lafayette
Tan T.	UCSI University
Chen S.	Anqing Teachers College
Sahli Z.	Université Ferhat Abbas de Sétif
Kim C.	Yeungnam University
Li F.	Shandong University
Meva'a L.	University of Yaoundé
Wadood A.	Yeungnam University
Le Y.	State Grid Zhejiang Electric Power Corporation
Khunkitti S.	Khon Kaen University
Hong Wong C.	UCSI University
Shim M.	Inha University, Incheon
Dong X.	North China Electric Power University
Du Y.	State Grid Ganzhou Electric Power Supply Company
Xie L.	China Electric Power Research Institute
Li L.	Huazhong University of Science and Technology
Du X.	Southeast University
Fang C.	State Grid Shanghai Municipal Electric Power Company
Ndzana B.	University of Yaoundé
Yew Pang J.	Heriot-Watt University, Malaysia
Hu Z.	Zhejiang Electric Power CorporationWenzhou Power Supply Company
Chen Y.	Zhejiang University
Liu J.	State Grid Shanghai Municipal Electric Power Company
Xue L.	Northeast China Institute of Electric Power Engineering
Yimen N.	University of Yaoundé
Khurshiad T.	Yeungnam University
Kim N.	Hyosung Group
Shao B.	State Grid Liaoning Electric Power Company Limited Electric Power Research Institute
Guo B.	Jilin University
Li K.	Beihang University
Kuang J.	Shandong University
Yu J.	Anyang Institute of Technology
Sun J.	Beihang University
Ling P.	State Grid Shanghai Municipal Electric Power Company
Guo B.	North China Electric Power University
Li C.	Huazhong University of Science and Technology
Leiva, J	Universidad de Malaga
Li J.	Electric Power Research Institute of State Grid Liaoning Electric Power Co. Ltd.
Kuo Y.	Taiwan Power Company
Yang X.	Chongqing University
Yu L.	Tianjin University of Commerce
Zhang Y.	Zhoushan Power Company of State Grid
Niu F.	Zhejiang University
Ogando-Martínez A.	Universidad de Vigo
Han X.	State Grid Sichuan Electric Power Company
Ren X.	Tianjin University of Commerce
Gan C.	Zhoushan Power Company of State Grid

Table 2. *Cont.*

Author	Affiliation
Xiao L.	Tianjin University of Commerce
Fan C.	State Grid Sichuan Electric Power Research Institute
Ton T.	Thu Duc College of Technology
Zhang J.	Northeast Electric Power University
Chen H.	Tsinghua University
Zhou H.	Northeast Electric Power University
López-Gómez J.	Universidad de Vigo
Jiang S.	Anqing Teachers College
Lu S.	Taiwan Power Company
Sun G.	South China University of Technology
Cheng P.	Guangzhou Power Supply Bureau Co., Ltd.
Li X.	North China Electric Power University
Cheng W.	Shenzhen Power Supply Bureau Co., Ltd.
Cheng R.	Shenzhen Power Supply Bureau Co., Ltd.
Lee H.	Korea Electrotechnology Research Institute
Chen Z.	State Grid Sichuan Electric Power Research Institute
Shi J.	Shenzhen Power Supply Bureau Co., Ltd.
Abdo M.	Aswan University
Carmona R.	Universidad de Malaga
Wei W.	South China University of Technology

4. Brief Overview of the Contributions to this Special Issue

4.1. Keyword Analysis

The analysis of the keywords identifies or summarizes the work of the researchers. This section analyses the keywords obtained from the 36 manuscripts published in this special issue [1–36]. The keyword analysis of the papers of this special issue shows a wide variety of terms, reaching 135 different keywords. Figure 1 shows a cloud of words using author keywords. The most used and highlighted keywords are: Optimal power flow, genetic algorithm, optimization, particle swarm optimization, demand response, energy management, metaheuristic, and wind power. If we split the author keywords in simple words, it is possible to get Figure 2, where the highlighted words are now: Optimal, power, energy, system, and algorithm.

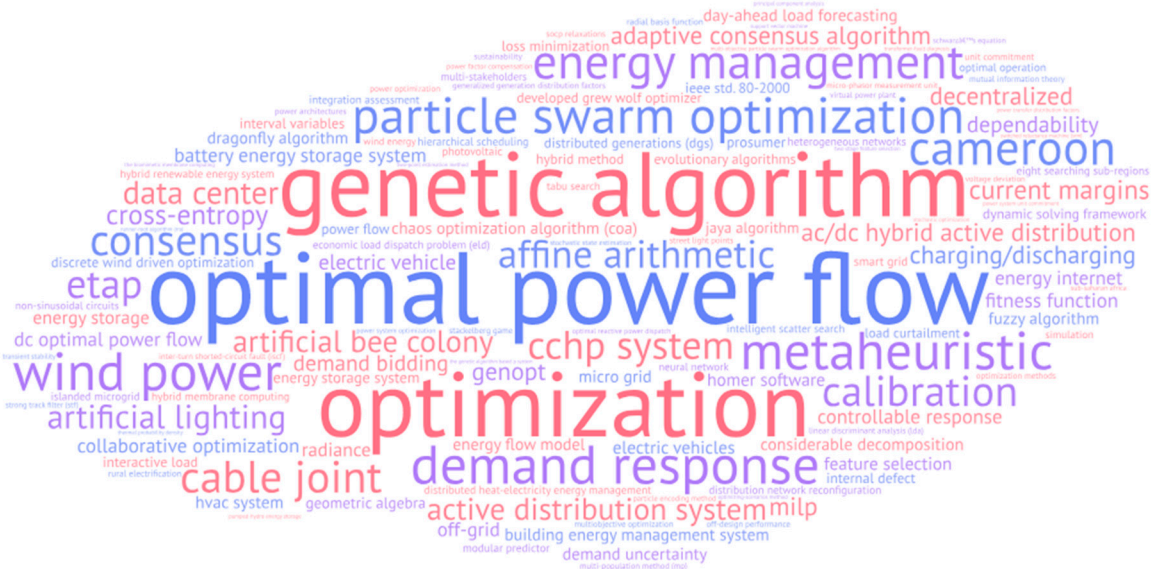

Figure 1. Cloud word of the author keywords related to the special issue.

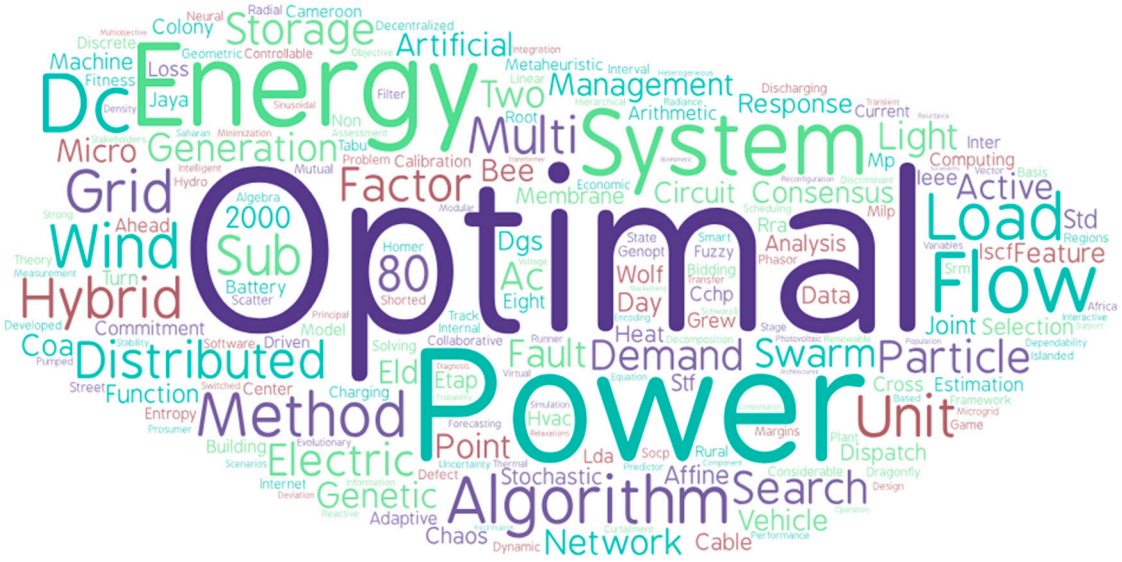

Figure 2. Cloud word for split author keywords related to the special issue.

4.2. Analysis of Author Relationship

Figure 3 shows a graph with the authors of this special issue. Each author is a node and a different color indicates their affiliation country. If an author collaborates with another one, then a link highlights the relationship between them. The larger the size of the node, the larger the H-index of this author. As expected, there is no relationship between authors of the different manuscripts, unless they are authors who have contributed to more than one, but they were exactly the same authors. What does attract attention is that there are at least nine papers with international collaboration, i.e., between authors from different countries, and two of them are collaborations between authors from at least three different countries.

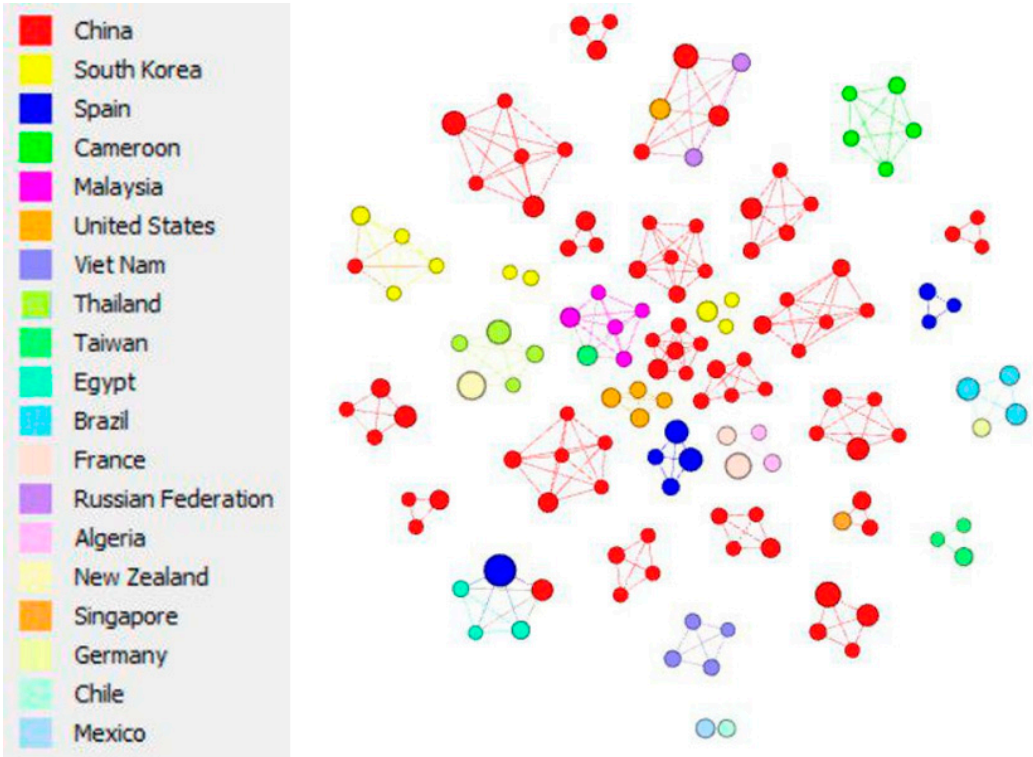

Figure 3. International interconnection between authors.

Conflicts of Interest: The authors declare no conflict of interest

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