Muwaffaq Irsheid Alomoush, Ph.D.

Dean and Professor of Power Engineering
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PERSONAL DATA

Date of Birth : January 24, 1967
Place of Birth : Al-Mafraq, Jordan
Nationality : Jordanian
Sex : Male
Marital Status : Married with four children

EDUCATION

Ph.D., Electrical Engineering, 2000
Illinois Institute of Technology (IIT), Chicago, Illinois, USA.
Dissertation Title: Auctionable Fixed Transmission Rights for Congestion Management

M.Sc., Electrical Power Engineering, 1994
Jordan University of Science and Technology, Irbid, Jordan
Thesis: Switching Operations Impact on the Transient Behavior of Large Induction Motors

B.Sc., Electrical Engineering – Power Engineering, 1990
Jordan University of Science and Technology, Irbid, Jordan

FIELDS OF INTEREST

Electrical Power Systems: restructuring, economics, control, optimization and decision-making, congestion management, transmission rights, and security.
FACTS devices: modeling, control and usage of FACTS in restructured environment and for power system stability purposes.

PROFESSIONAL EXPERIENCE

- **Yarmouk University**, Department of Electrical Power Engineering, (Irbid, Jordan), July 2011-Now, ***Professor*** and ***Dean***.
- **Yarmouk University**, Hijjawi Faculty of Engineering Technology, (Irbid, Jordan), September 2010–July 2011, ***Associate Professo****r* and ***Dean***.
- **Yarmouk University**, Hijjawi Faculty of Engineering Technology, (Irbid, Jordan), August 2008–August 2010, ***Associate Professo****r* and ***Vice Dean***.

- **German-Jordanian University**, Department of Energy, (Amman Jordan), September 2007–August 2008, ***Associate Professo****r* (***Sabbatical Leave***).
- **Yarmouk University**, Department of Electrical Power Engineering, (Irbid, Jordan), December 2004–September 2007, ***Associate Professor***.
- **Yarmouk University**, Department of Electrical Power Engineering, (Irbid, Jordan), June 2000–December 2004, ***Assistant Professor***
- **Illinois Institute of Technology**, Electrical and Computer Engineering Dept., (Chicago, Illinois, USA), 1999–2000, ***Post-doctoral Visiting Scholar***
- **Illinois Institute of Technology**, Electrical and Computer Engineering Dept., (Chicago, Illinois, USA), 1996–1999, ***Research Assistant***
  Topic: Deregulated (Restructured) Power Systems
  Fields of Knowledge: Congestion Management, Power Markets, Energy Management Systems, Energy Trading, Power System Security, Risk Management
- **Yarmouk University**, Department of Electrical Power Engineering. (Irbid, Jordan), 1993–1996, ***Instructor*** :
  Electrical Machines Labs, Measurements Lab, Electrical Circuits, Engineering Mathematics.
- **Jordan University of Science and Technology, Electrical Engineering Dept. (Irbid, Jordan), 1991–1993, *Teaching Assistant:***
  Power Systems, Electrical Machines (AC and DC) and Circuits Labs

ACADEMIC AWARDS AND HONORS

- The Hisham Hijjawi ***Academic Distinction Award in the Field of Teaching***, Hijjawi Faculty for Engineering Technology, Yarmouk University, 2003.
- The Hisham Hijjawi ***Academic Distinction Award in the Field of Scientific Reasearch*** for publications in The IEEE Journals, Hijjawi Faculty for Engineering Technology, Yarmouk University, 2003.
- Graduate Research Assistantship, Illinois Institute of Technology, 1997-2000.
- PhD scholarship from Yarmouk University, 1997-2000.
- Graduate Teaching Assistantship granted by Jordan University of Science and Technology, 1991-1993.
- Ranked First in Tawjihi (the General Secondary Certificate Examination) in the Municipality of Al-Mafraq, for the year 1985.

PUBLICATIONS

Book

1. M. Shahidehpour and M. Alomoush, *Restructured Electrical Power Systems: Operation, Trading and Volatility*, Marcel Dekker Inc., New York, USA, 2001.

Book Chapter

2. M. Shahidehpour and M. Alomoush, "Decision Making in a Deregulated Power Environment Based on Fuzzy Sets," Book chapter, *Modern Optimization Techniques in Electric Power*, Kluwer Publishers, 1999.

3. M. Alomoush and M. Shahidehpour, "Transmission Congestion Management and Pricing," Book Chapter, *Market Operations in Electric Power Systems: Forecasting, Scheduling, and Risk Management, John Wiley & Sons, NY, 2002, pp.369-453.*

Published Journal Papers

4. A. Shaltout and M. Alomoush "Reclosing Torques of Large Induction Motors with Stator Trapped Flux," IEEE Transactions on Energy Conversion, 11 (1), March 1996, pp. 84-91.
5. M. Alomoush and M. Shahidehpour, "Fixed Transmission Rights for Inter-Zonal and Intra-Zonal Congestion Management," IEE Proc.-Generation, Transmission and Distribution, 146 (5), Sept. 1999, pp. 471-476.
6. M. Alomoush and S. M. Shahidehpour, "Generalized Model for Fixed Transmission Rights Auction." Journal of Electric Power Systems Research, 54 (3) (2000), pp. 207 - 220.
7. M. Alomoush and M. Shahidehpour, "Contingency-Constrained Congestion Management with a Minimum Number of Adjustments in Preferred Schedules," Journal of Electric Power and Energy Systems, 22 (4) (2000), pp. 277-290.
8. M. Alomoush, "Derivation of UPFC DC Load Flow Model with Examples of its Use in Restructured Power Systems," IEEE Transactions on Power Systems, 18 (3), 2003, 1173-1180.
9. M. Alomoush, "Exact Pi-Model of UPFC-Inserted Transmission Lines in Power Flow Studies," IEEE Power Engineering Review, December (2002) 54-56.
10. M. Alomoush, "Significance of Thyristor-Controlled Series Compensations in Restructured Power Systems," International Journal of Power and Energy Systems, Special Issue on Blackouts, 2004, 8-14.
11. M. Alomoush, "Impacts of UPFC on line flows and transmission usage," Journal of Electric Power Systems Research, 71 (3), 2004, 223-234.
12. M. Alomoush, "Performance Indices to Measure and Compare System Utilization and Congestion Severity of Different Dispatch Scenarios," Journal of Electric Power Systems Research, 74(2), 2005, 223-230
13. W. Abu-Elhaija, A. Al-Zaben and M. Alomoush, "Quantifying Severity of Unbalanced Conditions of Induction Motor Using Wavelet Entropy," Electric Power Components and Systems, 34 (9), 2006, pp. 1001-1013.
14. M. Alomoush and S. Albatran, "Simulink-Based Implementation Of TCSC-Operated Single-Phase Induction Motor as an Educational Tool," Acceted for publication in the Journal of Computer Applications in Engineering Education, Published online in Wiley InterScience (www.interscience.wiley.com); DOI 10.1002/cae.20332.
15. M. Alomoush, "Considering Line Status in The Dispatch Process to Minimize Transmission Congestion Cost and Maximize System Usage," International Journal of Power and Energy Conversion, 2 (1), 2010, pp. 1-15.
16. M. Alomoush, "Incorporating Voltage Stability Limit in Competitive Energy Market Optimal Dispatch," Abhath Al-Yarmouk: Basic Sciences and Engineering, 19 (1), 2010, pp.37-56.
17. M. Alomoush, "Fractional Calculus Based Optimal Controllers of Automatic Voltage Regulator in Power System," Journal of Control and Intelligent Systems, 38(1), 2010, pp.40-48.

18. Muwaffaq I. Alomoush, “Load frequency control and automatic generation control using fractional-order controllers,” Journal of Electrical Engineering, 91(7), 2010, pp. 357–368.
19. M. Alomoush, “Modeling of Static Synchronous Series Compensator for Energy Markets Approximate Calculations,” Abhath Al-Yarmouk: Basic Sciences and Engineering, 18 (2), 2009, pp. 153-166.
20. M. Alomoush and S. Abatran, “Modeling and Simulation Of TCSC-Operated Single-Phase Induction Motor”, Journal of Electrical Systems, Vol. 6, No. 1, 2010, pp.1-15.
21. Muwaffaq I. Alomoush, “Multicriteria selection of optimal location of TCSC in a competitive energy market,” Journal of Electrical Engineering, Vol. 61, No. 3, 2010, pp. 129-140.
22. Muwaffaq I. Alomoush, “Coordinated Tuning of TCSC and PSS for Damping Power System Oscillations Using Bacterial Foraging Algorithm,” Accepted for publication in the IEEE Transactions on Evolutionary Computation.
23. M.I. Alomoush, “Bacterial Foraging Based Optimal Controller of The LFC in an Interconnected Power System,” submitted for review and publication in the Journal of Control and Intelligent Systems.

Published Conference Papers

24. M. Alomoush and M. Shahidehpour, “Exact Extension of Contingency Area using Successive Solutions and Distribution Factors,” in Proceedings of the 1999 American Power Conference, Chicago, IL, Apr.1999.
25. M. Alomoush and M. Shahidehpour, “Decision in a Deregulated Power Environment Based on Fuzzy Approach,” in Proceedings of the 1998 Large Engineering Systems Conference on Power Engineering, Nova Scotia, Canada, June 1998, pp. 305-310.
26. A. Shaltout and M. Alomoush “Circuit Breaker Simulation for Induction Motor Transient Calculations,” presented at a Conference on Computational Aspects and Their Applications in Electrical Engineering, May 21-23, 1995, Amman, Jordan.
27. M. Alomoush and M. Shahidehpour, “Impact of Wheeling Transactions on Zonal Congestion with FTR,” in Proceedings of the 1999 Large Engineering Systems Conference on Power Engineering, Nova Scotia, Canada, June 1999, pp.231-236.
28. M. Alomoush, “ Static Synchronous Series Compensator to Help Energy Markets Resolve Congestion-Caused Problems,” accepted for presentation and publication in the Proceedings of the 2004 Large Engineering Systems Conference on Power Engineering, Nova Scotia, Canada, July, 2004.
29. M. Alomoush, “Using Performance Indices and Analytic Hierarchy Process to Select Best Dispatch Option of Energy Markets,” Proceedings of the 39th International Universities Power Engineering Conference (UPEC2004), 6th – 8th September 2004, UWE Bristol, UK.
30. Awad Al-Zaben, Wejdan Abu-Elhaija, Mowaffaq Alomoush, "Identification of Three Phase Transformer Abnormal Conditions Using Wavelet Entropy," Proceedings of the IEEE International Electric Machines and Drives Conference, 2007 (IEMDC '07) , 3-5 May 2007, Antalya, Turkey, Vol. 2, pp.1529 – 1533.
31. Muwaffaq I. Alomoush, "Multicriteria Optimal Location of TCPAR in a Competitive Energy Market Using ELECTRE III," Proceedings of the 44th International Universities' Power Engineering Conference (UPEC2009), 1st-4th september 2009, Glasgow, Sctotland.

32. Muwaffaq I. Alomoush, "Coordinated Tuning of IPFC and PSS to Improve Power System Stability Using BFO" Accepted in the 45th International Universities Power Engineering Conference (UPEC 2010), Cardiff, Wales UK.

Papers Submitted to Journals

33. Muwaffaq I. Alomoush, "A Multicriteria Approach for Selecting an Optimal Dispatch Scenario in a Competitive Energy Market," submitted for review and publication in the International Journal of Applied Decision Sciences.
34. Muwaffaq I. Alomoush and Wejdan Abu-Elhaija, "Tuning Power System Stabilizer Using Bacterial Foraging Algorithm," submitted for review and publication in the International Journal of Electrical Power and Energy Systems.
35. Muwaffaq I. Alomoush, "Using Fractional-Order Controlled TCSC to Improve Damping of Power System Oscillations," submitted for review and publication in the IEEE Transactions on Power Systems (under revision).
36. Muwaffaq I. Alomoush, "Using Bacterial Foraging to Tune Control Signals of IPFC for an Improved Damping of Power System Oscillations" submitted for review and publication in the IEEE Transactions on Power Delivery.
37. Muwaffaq I. Alomoush, Idrees S. Al-Kofahi, and Yasser N. Anagreh, "Coordinated Tuning of TCSC and PSS Using Simulated Annealing Algorithm for Damping Power System Oscillations," submitted for review and publication in the Journal of Energy Conversion & Management.
38. Muwaffaq I. Alomoush and Sameer F. Mohammad, "Procuring and Pricing Reactive Power Considering Generator Capability Curve, Reactive Power Resources and Power Factors," submitted for review and publication in the IEEE Transactions on Power Systems (under revision).
39. Sameer F. Mohammad and Muwaffaq I. Alomoush, "Modeling of Generator Lost Opportunity Cost, Accurate Capability Curve and Power Factors in Electricity Markets," submitted for review and publication in The IEEE Transactions on Power Systems (under revision).

TEACHING ACTIVITIES

Courses

Undergraduate course:	Power Systems, Power System Analysis I, Power System Analysis II, Automatic Control Theory, Electric Circuit Analysis I, Electric Circuit Analysis II, Engineering Mathematics, Electronic Circuits, Engineering Drawing, Electrical Workshop, Electrical Machines I,
Graduate course:	Restructured Electrical Power Systems, Power System Operations and Control.

Labs

Automatic Control, Electric Circuit, Electronic Circuits, Electrical Workshop, Electric Machines, Power System Applications.

Graduation Projects

A large number of primary and secondary graduation projects, for undergraduate students, has been conducted under my supervision in different fields of electrical power engineering, including but not limited to, power system economics, power system security, power system sate

estimation, electrical machines dynamics, power system dynamics, fuzzy logic, optimal controller design of electric machines and power systems, nuclear power plants, power system visualization, power system calculations, and learning power system software packages.

LANGUAGES

Arabic (Native), English (Excellent)

JOURNAL TECHNICAL REVIEW ACTIVITIES

1996–present: The *IEEE Transactions on Power Systems*.
1996–present: The *IEEE Transactions on Energy Conversion*.
2000–present: The *IEEE Power Engineering Letters*.
2002–present: The *Journal of Electric Power and Energy Systems*.
2008–present: The *European Transactions on Electrical Power*.
2008–present: The *International Journal of Engineering Education*.
2008–present: The *International Journal of Automation and Control*.
2008–present: The *International Journal of Modeling and Simulation*.
2009–present: The *IEEE Transactions on Power Delivery*.
2010–present: The *Journal of Dirasat, Jordan University*.
2010–present: The *IEEE Transactions on Evolutionary Computation*.

CONFERENCE REFEREEING ACTIVITIES

Many national and international conferences.

SUPERVISION OF GRADUATE WORK

- Associate Supervisor: Eyad K. Maa'yteh, " Identification and Control of DC Motors Using Neural Network Based Appraoch, Department of Computer Engineering, Hijjawi Faculty for Engineering Technology, Yarmouk University, 2005.
- Supervisor: Sameer F. Mohammad, " An Improved Mechanism for Real-Time Reactive Power Pricing in a Competitive Electricity Market, " Department of Power Engineering, Hijjawi Faculty for Engineering Technology, Yarmouk University, 2010.
- Supervisor: Heba M. Aljamal, " Optimal Design of Interline Power Flow Controller to Damp Power System Oscillations Using Genetic Algorithm," Department of Power Engineering, Hijjawi Faculty for Engineering Technology, Yarmouk University, 2010.
- Supervisor: Kahrman A. Al-Hamad, "Coordinated Tuning of TCSC and PSS in Multi-Machine Power Systems Using Particle Swarm Optimization," Department of Power Engineering, Hijjawi Faculty for Engineering Technology, Yarmouk University, 2010.
- Supervisor: Ayman A. Al-Quraan, "Tuning of Unified Power Flow Power Flow Controller Using GA and PSO," Department of Power Engineering, Hijjawi Faculty for Engineering Technology, Yarmouk University, 2011.
- Supervisor: Sami Zwatten, "Optimal Allocation of Distributed Generation in Distribution System Using Multiobjective Optimization," Department of Power Engineering, Hijjawi Faculty for Engineering Technology, Yarmouk University, 2012.

- Supervisor: Habes A. Al Khawaldeh, "Tuning of Static Synchronous Compensator in a Power System for Oscillation Damping Using Fuzzy Logic," Department of Power Engineering, Hijjawi Faculty for Engineering Technology, Yarmouk University, 2012.
- Supervisor: Issa Ibrahim Al-sleehat, "Optimal Location of UPFC in Jordanian Network Considering Nuclear Power Generation," Department of Power Engineering, Hijjawi Faculty for Engineering Technology, Yarmouk University, 2012.

MEMBERSHIP OF UNIVERSITY COMMITTEES

- Membership of the University Council for Graduate Studies for the academic years 2008/2009 and 2009/2010, representing the Hijjawi Faculty for Engineering Technology.
- Member of the Faculty Council, Hijjawi Faculty for Engineering Technology for the academic years 2002/2003, 2008/2009, and 2009/2010.
- Head of the Graduate Studies Committee, Hijjawi Faculty for Engineering Technology for the academic years 2008/2009 and 2009/2010.
- Head of the Curriculum Committee, Hijjawi Faculty for Engineering Technology for the academic years 2008/2009 and 2009/2010.
- Member of the Research Committee, Hijjawi Faculty for Engineering Technology for the academic year 2008/2009.
- Head of the Library Committee, Hijjawi Faculty for Engineering Technology for the academic years 2008/2009 and 2009/2010.
- Member of the ABET Accreditation Committee, Department of Power Engineering, Hijjawi Faculty for Engineering Technology
- Member of Faculty Website Developing Committee, Hijjawi Faculty for Engineering Technology for the academic year 2001/2002.
- Head and member of several promotions and sabbatical leave committees.
- Member of CIGRE National Committee representing the Yarmouk University, 2009, 2010.
- Head and member of many Graduation Project Exam Committees.
- Head and member of many Field Training Exam Committees.
- Member of many student transfer and equivalent courses committees, department of power Engineering.
- Member of the technical committee of the International Medical Informatics and Biomedical Engineering Symposium, Amman, Jordan, April, 2006.
- Member of the technical committee in charge of establishing the Technology Specialist programs at Hijjawi Faculty for Engineering Technology.
- Head of the Evaluation committee of Distinguished Student Awards, Hijjawi Faculty for Engineering Technology for the academic year 2007/2008.
- Member of the organizing committee of International Medical Informatics and Biomedical Engineering Industrial Show, Yarmouk University, 2009.

- Member of the Permanent Technical Committee for Electrical Equipments and Instruments (No. 42), Jordan Institution for Standards and Metrology (JISM), representing Yarmouk University, 2009-Now.
- Member of the Technical Evaluation Committee of the Candidate Incubator Innovative Projects, Jordan Innovative Center (JIC) at Al-Hassan Industrial Estate, Irbid, Jordan, representing Yarmouk University, 2007-Now.
- Head of the Organizing and Technical Committees of the Seminar of Applied Industries for Arab Universities, Yarmouk University, 2010.
- Head of the Organizing Committees of the Seminar of Renewable Energy for Arab Universities, Yarmouk University, 2010.
- Member of The Hisham Hijjawi Academic Distinction Award, Hijjawi Faculty for Engineering Technology, Yarmouk University, 2009.

MEMBERSHIP OF SCIENTIFIC AND PROFESSIONAL SOCIETIES

- Jordan Engineering Association.
- Engineering and Scientific Research Groups, Paris, France
- International Association of Engineers (IAENG), Hong Kong

COMPUTER SKILLS

MS-DOS, MS-Office, Adobe Acrobat, FORTRAN, Matlab, Simulink, LINDO, Many power Engineering Software packages.

STATEMENT OF TEACHING PHILOSOPHY

I believe that the role of a teacher is that of a leader who shows the path, motivates, encourages and leads by example. An effective teacher ignites a student's desire to learn, a desire to improve on weaknesses, and a desire to succeed. A teacher should be totally involved with the class, dedicated to students and be willing to devote time and energy for them. Love for teaching evokes passion and dedication.

A good teacher should have sound fundamentals and command over the concepts as well as a broad knowledge beyond the realms of the particular course being taught. Thus, a teacher can provide useful inter-disciplinary examples which make learning very interesting and motivate the students. I set high standards for myself as well as for my students. In every course I teach I do my best to have thorough command of the subject matter. Therefore, I prepare for my lectures by reviewing the textbook material, reading my notes, browsing reference books and sometimes papers, until I feel comfortable that I understand it thoroughly. In addition, I try to integrate into my undergraduate and graduate classes the findings of my research. My enthusiasm comes naturally because I am a work-loving instructor.

A good teacher needs to personalize the needs and problems of the students as in the case of a few of the weaker or shy students who need additional help but hesitate to ask for it. Students tend to learn more effectively from an approachable teacher who sets up a comfortable atmosphere conducive to learning. Thus, the education goes beyond the classroom and students tend to visualize the teacher as a role model from whom they seek advice on topics ranging from fundamental concepts to future careers options, other personal problems and recommendations.

In the first lecture of every course after introducing myself to students and asking them to introduce themselves I ask them to share their thoughts on "what do think this course is about?", then I spend the rest of the lecture by exploring the title of the course and the text book. Then I elaborate on the importance of the course and its relevance to other future courses and career.

In my opinion, identifying the students by their full names and knowing some background information is very beneficial. Therefore, one of my philosophy's ingredients is that I learn students' names in the class and through my interactions with them during my office hours. I make a sincere effort to learn their names, even in classes with a large number of students. It is amazing how responsive students become when they think a teacher knows their names. I let them know they can approach me at any time to ask questions or seek advice.

I always teach my students to enjoy what they study in my course in order to get better grades. From my experience, having good sense of humor in certain situations is an added advantage. To make the learning process a pleasure, I motivate the class by asking “why we need to learn this part”, “what is the relationship between this part and other parts?”, "do you think there is other method to solve this problem?". At times, I ask the class some “what if” questions in the end of solving an example. My class lectures always incorporate open questions, forcing students to share their thoughts. As a teacher, I recognize the importance of creating a learning environment where students feel safe to contribute, comfortable to criticize, and self-confident enough to ask questions.

I believe that technology is very useful and should be utilized effectively in teaching. I use handouts and visual aids whenever possible in my lectures. I have a collection of detailed transparencies, tutorials and lecture notes from good resources which I make available to students. In addition, I encourage the use of state-of-the art software packages related to the courses I teach.

Electrical engineering involves a significant amount of teamwork after graduation. Therefore, in advanced undergraduate courses and graduate courses, I strongly advocate reports, projects, papers and presentations involving student groups, which provide students with vital opportunities to effectively work as a team for the purpose of initiating group work.

Quiz, project, assignment, and exam are all feedback components, which are very important in teaching performance enhancement. In addition to faculty input, and discussions with peers, my students’ responses are the best source for improving my teaching techniques which are evolving on a continuous basis. I highly value the role of feedback in teaching. After each exam I ask my students for any suggestions for improvements in the course for the rest of the semester, and to learn the level of satisfaction with the course and with the way I am teaching them.

As a teacher, I am not afraid to learn from students. Together with my students, I grow and learn in each class that I teach.