

# Fouad Rashed Fouad Zaro

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**Address:** Palestine Polytechnic University,  
Electrical Engineering Department, Chairman  
Hebron, Palestine

**Phone:** +970 569 998 483 (Mobile)

**E-mail** fzaro@ppu.edu  
zarofuad@gmail.com

**Skype  
Name** zarofuad

## Bio Information:

**Date of Birth:** April-07-1981.  
**Nationality:** Palestinian / Jordanian Passport.  
**Marital status:** Married with Five children.

## Education:

- **March 2013: PhD in Electrical Engineering** from King Fahd University of Petroleum and Minerals (KFUPM) - Dhahran, Saudi Arabia. (3.84 on scale 4) GPA. PhD Dissertation Title: "Efficient Techniques for Detection and Mitigation of Power Quality Events".
- **Feb 2010: M.S. in Electrical Engineering** from King Fahd University of Petroleum and Minerals (KFUPM) - Dhahran, Saudi Arabia. (3.78 on scale 4) GPA. MS Thesis Title: "Multi-Objective Optimal Power Flow in Deregulated Environment".
- **Jun 2004: BS. In Electrical Engineering** from Palestine Polytechnic University (PPU), Hebron, Palestine. (85.9 %) GPA. Rating "Excellent".
- **1999:** Teriq Iben Zeyad High School – Hebron, Palestine. (84.8%).

## Graduate Courses Taken:

1. Power System Steady State Analysis.
2. Power System Operations.
3. Power System Dynamic Analysis
4. Power System Planning.
5. Transmission Electrical Energy.
6. HVDC Transmission System.
7. Linear Control Systems.
8. Intelligence Control.
9. Modeling and System Identification I.
10. Advanced Power Electronics.
11. Digital Signal Processing I.
12. Analog Integrated Circuits Design.
13. Mathematics Methods for Engineers.
14. Special Topics in Math: Matrix Theory.
15. Special Topics in Systems Engineering: Intelligence Techniques.
16. Advanced Electrical Engineering Projects.
17. Directed research I.
18. Directed Research II.
19. Seminar.

## Awards:

- King Fahd University of Petroleum & Minerals Teaching Assistantship (Lecturer B), Feb 2010 – Present.
- King Fahd University of Petroleum & Minerals Research Assistantship (Research Assistant), Jul 2007 – Jan 2010.

## Research Interests:

- Electrical Power Quality.
- Wavelet Transforms Applications in Electrical Power System.
- DSTATCOM Device.
- Artificial Intelligent Techniques Application in Power System.
- Multi-objective Optimal Power Flow.
- Power System Operation, Planning, Economics and management.
- Smart and Micro grids.
- Renewable Energy Resources.
- Impact Study for PV Systems.

## Technical Skills:

### RESEARCH:

- Building and simulating real distribution networks using Power World Simulator Program.
- Building and simulating HVDC Transmission system using ETAP Program.
- Developing, coding, and implementing optimization techniques using Matlab.
- Developing and improving real multi-objective optimal power flow using particle swarm optimization.
- Designing power quality monitoring system using new method for calculation of rms values of the voltage.
- Applying Wavelet transforms for detection estimation power quality problems.
- Building power quality monitoring system using the latest technologies for digital signal processing.
- Designing control strategies for power quality problem mitigation devices.

### INFORMATION TECHNOLOGY:

- Programming: LabVIEW, MATLAB.
- Simulation Package: Simulink, Simulator Program, ETAP, EDAS.
- Microsoft Office: Word, Excel, PowerPoint, and Visio.

## International Seminars Presented

- **Power Quality Problems Detection and Estimation**, King Fahd University of Petroleum and Mineral, Saudi Arabia, 13 Mar 2013.
- **Characterization of Short-duration Voltage Events**, presented in 2012 PECon (IEEE International Conference), 2-5 December 2012, Kota Kinabalu Sabah, Malaysia.
- **Multi-Objective Optimal Power Flow Using Particle Swarm Optimization in Deregulated Environment**, presented in 11<sup>th</sup> ISDA (IEEE International Conference), 22-24 November 2011, Cordoba, Spain.
- **Solving Dynamic Load Economic Dispatch Using GAMS Optimization Algorithm**, IEEE Jordan International Joint Conference on Electrical Engineering and Information Technology (JEEIT), April 2019, Amman, Jordan.
- **Real-Time Detection and Classification for Voltage Events Based on Wavelet Transform**, IEEE Jordan International Joint Conference on Electrical Engineering and Information Technology (JEEIT), April 2019, Amman, Jordan.

## Publications:

- **BOOKS:**

1. **Fouad Zaro**, M. A. Abido, “Multi-Objective Optimal Power Flow: Deregulation Perspective”, ISBN 978-3-8383-7996-8, Aug. 2010, LAP Lambert Academic Publishing AG & Co. KG Dudweiler Landstraße 99, 66123 Saarbrücken, Germany.
2. **Fouad Zaro**, M. A. Abido, Ibrahim Elamin, “Power Quality Events: Detection and Mitigation” Scholar's Press ( 2013-07-13), ISBN-13: 978-3-639-51585-5.

- **PATENTS:**

1. **Fouad Rashed Fouad Zaro**, Mohammad Ali Abido, Mohamed A. El-Gebeily, “Wavelet Transform System And Method For Voltage Events Detection And Classification”, Application number: 20150094975, Issued: April 2, 2015. <https://patents.justia.com/inventor/fouad-rashed-fouad-zaro>
2. Mohammad Ali Abido, **Fouad Rashed Fouad Zaro**, “Quadrature-Based Voltage Events Detection Method”, Application number: 20150094966, Issued: April 2, 2015. <https://patents.justia.com/inventor/fouad-rashed-fouad-zaro>

- **JOURNAL PAPERS:**

1. **F. R. Zaro**, Ibarahim Kiraikos, “Design and Implementation of A Solar PV Microgrid: A Case Study of Palestine”, *International Journal of Engineering and Innovative Research*, 3 (2) , 89-100. DOI: 10.47933/ijeir.858179,2021.
2. **F. R. Zaro**, "Power Quality Disturbances Detection and Classification Rule-Based Decision Tree", *International Journal of Engineering Science and Application*, Vol.5, No.1, pp. 1-6, March 2021.
3. **F. R. Zaro**, A. Tamimi, A. Barakat, “Smart Home Automation System,” *International Journal of Engineering and Innovative Research* 3:1 (2021), 68-88, <https://doi.org/10.47933/ijeir.781091>
4. **F. R. Zaro**, M. A. Abido, " Real-Time Detection and Classification of Power Quality Problems Based on Wavelet Transform", *Jordan Journal of Electrical Engineering (JJEE)*, Vol. 5, No.4, pp:222-242, 2019.

5. S. J Alqam and **F. R. Zaro**, "Power Quality Detection and Classification Using S-Transform and Rule-Based Decision Tree" *International Journal of Electrical and Electronic Engineering & Telecommunications, Indexed Scopus*, doi: 10.18178/ijeetc.180207.
6. **F. R. Zaro**, S. O Altakrouri, and M. A. Abido, "Efficient On-Line Detection Scheme of Voltage Events Using Quadrature Method" *International Journal of Electrical and Electronic Engineering & Telecommunications, Indexed Scopus*, doi: 10.18178/ijeetc.180408.
7. **F. R. Zaro**, "True Multi-Objective Optimal Power Flow in a Deregulated Environment Using Intelligent Technique" *Journal of Engineering Research and Technology*, Vol.3, Iss.4, September 2017.

- **CONFERENCE PAPERS:**

1. I. Kiriakos and **F. Zaro**, "Designing a Microgrid for a Real Grid Tied PV System," *2021 12th International Renewable Engineering Conference (IREC) IEEE*, 2021, pp. 1-11, doi: 10.1109/IREC51415.2021.9427841.
2. **F. R. Zaro** ; Mohamed A. Abido," Real-Time Detection and Classification for Voltage Events Based on Wavelet Transform" *2019 IEEE Jordan International Joint Conference on Electrical Engineering and Information Technology (JEEIT), IEEE*, DOI:10.1109/JEEIT.2019.8717476.
3. **F. R. Zaro** ; Salah J. Alqam,"Solving Dynamic Load Economic Dispatch Using GAMS Optimization Algorithm" *2019 IEEE Jordan International Joint Conference on Electrical Engineering and Information Technology (JEEIT), IEEE*, DOI: 10.1109/JEEIT.2019.8717534.
4. Zaher A. Saafin ; **F. R. Zaro** ; Mutaz Jawadeh, "Voltage Profile Improvement Using DSTATCOM Based on Artificial Intelligent Techniques" *2019 IEEE Jordan International Joint Conference on Electrical Engineering and Information Technology (JEEIT), IEEE*, DOI: 10.1109/JEEIT.2019.8717452.
5. **F. R. Zaro**; Hadeel Saraheen; Hammam Hersh," Prptotype Smart Irrigation System Based on Solar Cells", 2nd Undergraduate Research Conference in Palestine; Alquds University, Palestine, April, 2019. Getting award of the best project in Engineering and Science section of the conference.
6. Woroud Alnatsha, **F. R. Zaro**, Imad A. Khatib, Mutaz I. Jawadeh, " Techno-Economic Feasibility Analysis of Solar-Wind Energy Conversion System Utilizing Genetic Algorithm ", *IEEE, 6th International Conference on Electrical and Electronics Engineering (ICEEE)*, DOI: 10.1109/ICEEE2019.2019.00074, Istanbul, Turkey, 2019.
7. **F. R. Zaro**, O. Abbadi, A. A Arrah, "Modeling A Grid Connected VSC In EHD Improving The PQ- Indexes" *International Conference on Recent Advances in Electrical Systems, Tunisia,Indexed SCOPUS, JES*, December 23-25, 2018.

8. **F. R. Zaro**, Asia Rawashdeh, Sahar Al-Adam, "Smart Grid Design", 7<sup>th</sup> Students Innovation Conference, Hebron, Palestine, May 9<sup>th</sup> 2018. Getting award of the best project in the conference.
9. **F. R. Zaro** and M. A. Abido, "Real Time Detection and Classification Wavelet Transform-Based for Voltage Events," Towards carbon free society through smarter grids, Grenoble France, 16-20 June 2013.
10. S. Ameenuddin, **F. R. Zaro** and M. A. Abido, "Implementation of quadrature based RMS calculation on real-time systems," *International IEEE Conf Power and Energy Conference at Illinois*, February 22-23, 2013, USA.
11. **F. R. Zaro**, S. Elferik and M. A. Abido, "Optimal Estimation of Harmonics in Power System Using Intelligent Techniques," *The 32<sup>nd</sup> IASTED International Conference on Modelling, Identification and Control ~MIC 2013~* February 11 – 13, 2013, Innsbruck, Austria.
12. **F. R. Zaro**, M. A. Abido, S. Ameenuddin and I. M. El-Amin, "Characterization of Short-duration Voltage Events," *IEEE International Conf. on Power and Energy (PECon)*, 2-5 December 2012, Kota Kinabalu Sabah, Malaysia, pp.650-654.
13. **F. R. Zaro**, M. A. Abido, "Multi-objective optimal power flow using Particle swarm optimization in deregulated environment," *IEEE International Conf., 11<sup>th</sup> intelligent system design and application, 11<sup>th</sup> ISDA*, Cordoba, Spain, Dec.2011. pp. 1122-1127.
14. **F. R. Zaro**, I. M. Elamin, "Power Transfer Capability of Long Transmission Lines with Midpoint Sited FACTS Devices," the 1<sup>st</sup> Saudi Scientific Conference, Riyadh. Saudi Arabia, Mar. 2010.

### **Supervision of Master Theses**

1. Zaher Abdullah Saanfin, "Voltage Profile Improvement Using DSTATCOM Based on Artificial Intelligent Techniques", Master of Electrical Engineering (JMEE), PPU, Jan. 2019.
2. Woroud Alnatsha, "Techno-Economic Feasibility Analysis of Solar-Wind Energy Conversion System Utilizing Genetic Algorithm", Master of Renewable Energy and Sustainability (JAMILA), Sep. 2019.
3. Ibrahim Kiriakos, "Designing a Microgrid for a Real PV System Connected On Grid", Master of Electrical Engineering (JMEE), PPU, Dec. 2019.
4. Mohammed Elwawi, "Real Time Power Quality Monitoring Using Discrete Wavelet Transform", Master of Renewable Energy and Sustainability (JAMILA), January, 2020.
5. Nour Abu Ayyash, "Design and Management of Hybrid Renewable Energy System: A Case Study," Master of Renewable Energy and Sustainability (JAMILA), April, 2021.

## **Supervision of Graduate Bachelor Degree Projects**

1. Mohammad Abu rayieh, Hashim Tamimi and Nisreen Salman, " Design a 161 kV transmission line system from Huwara to Jenin", May 2017.
2. Alaa H. Katbeh, Fayez F. Qafesheh and Saleem Y. Rayyan, " Forecasting and Planning for Hebron Electrical Power System", May 2017.
3. Ahmad K. Atawneh, Ahmad M. Abualrub and Radwan J. Shalode," Harmonic study for Palestine Polytechnic University Wadi-Al Haria campus", Dec. 2017.
4. Asia Rawashdeh and Sahar Adem, "Smart Grid Design", Dec. 2017.
5. AbdulQader Shaheen, Ahmad Qwasmı and Feras Abdulbaset, " Design of Electrical Distribution System for Rawabi City" Dec. 2017.
6. Samer R. Odeh, Raed M. ALMohtaseb and Fadi I. Taha, " Development & Improvement of Power Distribution System for Hebron City" Dec. 2017.
7. Karma Shehadeh and Mahmoud Tamimi, " Artificial Neural Networks - Based Protection System", May 2018.
8. Ahmad Alqam, Salam Sobeh and Nade Awaisah," Impact Study of Maslamani Photovoltaic System on Tubas Distribution Grid", Dec. 2018.
9. Ali Mohammad Tamimi and Anas Radwan Barakat, " Smart Home Automation System", May 2019.
10. Hadeel Saraheen and Hammam Al-hersh, " Prototype for smart irrigation system based on solar cells", May 2019.
11. Anwar Abushokhadeem and Eman Albadawi, " Optimum Capacitor Placement and Size in the Distribution Grid using Genetic Algorithm", May 2019.
12. Amjad Kamal, " Contribution of M.V. & L.V. Grid Components In Technical Losses 10-MVA Grid – A Case Study", May 2019.
13. Mohammed Saadeh, Marwan Muharam and Bara Abu debs," Economic Analysis Of PPU Hybrid Energy Systems", Dec. 2019.
14. Motaz Qasem Solaiman, Kazem wohoush and Yazan Shamroukh," Minimizing the Power Losses in Hebron Electrical Power Grid", Dec. 2019.

## **Member of Master Thesis Discussion Committee**

1. Wafa Qutaina," Modeling and Control of Shunt Active Power Filter in Medium Voltage applications", Birziet University, April 2019.
2. Hareth Shalaldeh, "Islanding Detection Approach for Grid-Connected PV Inverter Using ANN Based DWT", Palestine Polytechnic University, Master of Renewable Energy and Sustainability (JAMILA), January 2020.

3. Areej Alia, "Predicting I-V curve for photovoltaic modules using Random Forests Technique", An-Najah University, July 2020.

## Workshops and Forums:

1. **Power Quality Workshop**  
King Fahd University of Petroleum and Minerals.  
Saudi Arabia, 13 Mar 2013.
2. **15<sup>th</sup> Saudi Technical Exchange Meeting.**  
King Fahd University of Petroleum and Minerals.  
Saudi Arabia, 18-19 Dec 2012.
3. **2<sup>nd</sup> KFUPM Technology Forum**  
King Fahd University of Petroleum and Minerals.  
Saudi Arabia, 15-16 May 2012.
4. **7th Symposium on Industrial Systems and Control (SISC 2012)**  
King Fahd University of Petroleum and Minerals.  
Saudi Arabia, 13-14 May 2012.
5. **Power Quality.**  
King Fahd University of Petroleum and Minerals.  
Saudi Arabia, 14 March 2012.
6. **Machine Drive.**  
King Fahd University of Petroleum and Minerals.  
Saudi Arabia, 13 March 2012.
7. **Winter Enrichment Program (WEP 2012)**  
King Abdullah University of Science and Technology.  
Saudi Arabia, 21-28 Jan. 2012.

## Membership:

1. Jordanian Engineers Association (JEA), member (2005-present).

## Professional Experience:

- RESEARCH PROJECTS:
1. **Development of a New Harmonic Reduction System Based on Hybrid Heuristic Method for System Harmonic Mitigation.** (Proposed)  
National Science, Technology and Innovation Plan (NSTIP).  
King Abdulaziz City of Science & Technology (KACST).
  2. **Novel Methods of Digital Signal Processing Application for Power Quality Monitoring.**



National Science, Technology and Innovation Plan (NSTIP).  
King Abdulaziz City of Science & Technology (KACST).

**3. A New Harmonic Estimation and Mitigation System Using Wavelet Packet Transform**

King Fahd University of Petroleum and Minerals.

By Deanship of Scientific Research (DSR).

Role: Co-Investigator.

Duration: 36 Months. (01 January 2013 – 01 January 2016).

**4. Efficient Techniques for Power Quality Monitoring and Mitigation**

King Fahd University of Petroleum and Minerals. (PhD Dissertation)

Role: Principal-Investigator.

Duration: 3.5 years. (February 2010 – June 2013).

**5. Novel Tracking and Mitigation Strategies for Power Quality and Reliability Improvement in Electric Network.**

King Fahd University of Petroleum and Minerals. (Funded by KACST)

Role: Co-Investigator.

Duration: 2 years. (June 2010 – June 2012)

**6. Multi-Objective Optimal Power Flow in Deregulated Environment**

King Fahd University of Petroleum and Minerals. (M.S. Thesis)

Role: Principal-Investigator.

Duration: 2.5 years. (August 2007 – January 2010).

**7. Developing Hebron City Medium Voltage Grid using the Simulator Program**

Palestine Polytechnic University (PPU). ( B.S. Final year Project)

Role: Principal-Investigator.

Duration: one year. (September 2003 – June 2004).

▪ **TEACHING:**

<b>Jan. 2014 – Present</b>	<b>Assistant Professor</b> , Electrical Engineering Department, Palestine Polytechnic University (PPU), Hebron, Palestine.
<b>Feb. 2010 – Aug. 2013</b>	<b>Lecturer-B</b> , Electrical Engineering Department, King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, Saudi Arabia.
<b>Aug. 2007 – Jan. 2010</b>	<b>Research Assistant</b> , Electrical Engineering Department, King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, Saudi Arabia.
<b>Sept. 2005 – June 2007</b>	<b>Instructor</b> , College of Applied Professions, Palestine Polytechnic University (PPU), Hebron, Palestine.

▪ **ADMINISTRATIVE:**

- **Oct. 2019- Present** Chairman of Electrical Engineering Department, PPU.

▪ **Nov. 17-28, 2019**

Acting Dean of the Faculty of Engineering, PPU.

▪ **COURSES TAUGHT**

• **Graduate Studies**

• **Master of Renewable Energy and sustainability program (JAMILA):**

- Management and Economics Aspects for Renewable Energy. AlQuds University 2016.
- Management and Economics Aspects for Renewable Energy, Palestine Polytechnic University, 2019.

• **Master Electrical Engineering Program (JMEE)**

- Power quality, micro grids and standards of electric quality.(3times), PPU
- Power System Operation and Management, PPU, 2018
- Power System Planning, PPU,2019

• **College of Engineering at PPU**

Power System Analysis I, Power System Analysis II, Power System Protection, Electrical Power Plant, Electrical Distribution Systems, Power System Quality, Electrical Power Conversion, High Voltage Technology, Power System Economics, Electrical Circuits, and Introduction to Graduate Project.

• **College of Applied Professions at PPU**

Power Electronics, Electrical drive 1 & 2, Electronics 1, 2 and 3, Electrical layout and diagrams, Electrical protection & control equipment, Electrical workshop, Field training and several laboratories

• **College of Dual Studies at AlQuds University**

Electrical Power Engineering I, Electrical Engineering Power II, Electrical Power Generation, Control Systems, Power Systems and Transmission, Renewable Energy

• **Department of Electrical Engineering at King Fahd University of petroleum & minerals (KFUPM)**

Several Laboratories, and several tutorials for different electrical engineering courses.

**COMMITTEES MEMBER**

**A. Reviewer for Journal**

1. Advances in Science, Technology and Engineering Systems Journal (ASTESJ)
2. International Journal of Electronic Design and Test(JEDT)

**B. Organizing Committee Member**

1. International Conference on Electronics & Electrical Engineering (ICEEE) Seoul 2020, <https://www.iceee2020seoul.org/organizing-committee-member/fouad-rashed-fouad-zaro/2397>

### C. Technical Program Committee (TPC)

1. 9<sup>th</sup> International Conference on Sustainable Energy Information Technology Conference, (SEIT 2020), August 9-12, 2020, Leuven, Belgium
2. 20<sup>th</sup> IEEE Mediterranean Electrotechnical Conference, IEEE MELECON 2020, June 16-18, 2020, Palermo, Italy.
3. 7<sup>th</sup> International Conference On Electrical And Electronics Engineering (ICEEE2020), April 14-16, 2020, Antalya, Turkey.
4. 2<sup>nd</sup> International Symposium on Electrical, Electronics and Information Engineering (ISEEIE 2019), December 12-14, 2019, Auckland, New Zealand.
5. Jordan International Joint Conference on Electrical Engineering and Information Technology (JEEIT), April 9-11, 2019, Amman, Jordan.
6. 6<sup>th</sup> International Conference on Electrical and Electronics Engineering (ICEEE 2019), April 6-9, 2019, Istanbul, Turkey.
7. International Symposium on Electrical, Electronics and Information Engineering (ISEEIE 2018), December 13-15, 2018, Wellington, New Zealand.

#### ▪ **JOB:**

**May – Aug. 2005 Engineer**, Electrical Maintenance Section, Royal Co, Al-Khalil (Hebron), Palestine.

#### ▪ **TRAINING:**

- LabVIEW courses I, II, and III. Jeddah, Saudi Arabia, 5-17 Feb. 2011.
- Real Time Digital Simulation (RTDS), 30 hours duration in Nov. 2010, KFUPM, Saudi Arabia.
- OPAL-RT, 100 hours duration, May 2010, KFUPM, Saudi Arabia.
- Advanced Automation Techniques, Oct. 20 – Dec. 20, 2004, Germany.

### References:

**Prof. Mohammad Abido.**  
(M.S. and Ph.D. thesis advisor)  
Professor, EE dept.  
KFUPM, Dhahran, Saudi Arabia.  
mabido@kfupm.edu.sa  
Tel: 00966 3 860 4379

**Prof. Ibrahim El-Amin**  
(Ph.D thesis co-advisor)  
Professor, EE dept.  
KFUPM, Dhahran, Saudi Arabia.  
imelamin@kfupm.edu.sa  
Tel: 00966 3 860 2290

**Prof. Mustafa Abu Safa**  
VP-Academic Affairs for PPU  
PPU, Hebron Palestine  
[Mustafa@ppu.edu](mailto:Mustafa@ppu.edu)  
Tel 00970 2 22 33050

**Prof. Sameer Hanna**  
Professor, EE dept.  
PPU, Hebron, Palestine  
sameer@ppu.edu  
Tel 00970 599889623