

Faculty C.V.

1. **Name and date of birth**

G. Amjad Hussain, 15th Jan 1987

2. **Academic Rank**

Associate Professor (Full-time)

3. **Degrees**

- a) Doctor of Science (D.Sc/PhD) Aalto University, Finland, March 2016.
(Dissertation title: *Methods for Arc- Flash Prediction in Medium Voltage and Low Voltage Switchgear*)
- b) Master of Science (M.S) Aalto University, Finland February 2012.
- c) Bachelor of Science (B.E) UET Lahore, Pakistan Sept. 2007

4. **Service at this Institution**

- a) Associate Professor, October 2022-Present
- b) Assistant Dean, October 2020- Present
- c) Assistant Professor, September 2017-September 2022

5. **Professional Experience**

- a) Senior R&D Engineer- Eaton Corporation, Apr 2016- Aug 2017
- b) Research Scientist- Aalto University Finland, Apr 2011- Mar 2016
- c) Project Engineer- Al-Ahleia Switchgear Co. Kuwait, Feb 2008-Aug 2010

6. **Consulting Experience**

N/A

7. **Professional Registration**

- a) IEEE, Senior Member
- b) Kuwait Society of Engineers
- c) Pakistan Engineering Council

8. **Publications**

a. Patent:

- 1. Charles Luebke and Amjad Hussain, "Method and apparatus for measuring prospective short circuit current." U.S. Patent 10,884,068 issued, 2021.

b. Journal Papers:

- 1. M. Shafiq, B. G. Stewart, **G. A. Hussain**, W. Hassan, M. Choudhary and I. Palo, "Design and applications of Rogowski coil sensors for power system measurements: A Review", *Measurement (Elsevier)*, 2022, 112014.

2. M. Choudhary, M. Shafiq, I. Kiitam, **A. Hussain**, I. Palu, P. Taklaja, "A Review of Aging Models for Electrical Insulation in Power Cables", *Energies* 2022, 15, 3408. <https://doi.org/10.3390/en15093408>
3. W. Hassan, F. Mahmood, **G. A. Hussain**, S. Amin and J. A. Kay, "Feature Extraction of Partial Discharges During Multiple Simultaneous Defects in Low-Voltage Electric Machines," *IEEE Transactions on Instrumentation and Measurement*, vol. 70, pp. 1-10, 2021, Art no. 3523410.
4. Waqar Hassan, Farhan Mahmood, **Ghulam Amjad Hussain**, Salman Amin, "Risk assessment of low voltage motors based on PD measurements and insulation diagnostics", *Measurement (Elsevier)*, 176 (2021).
5. Zeeshan Rashid, Shadi Khan Baloch, **Ghulam Amjad Hussain**, "A Model-Based Approach for Jet Aircraft Lateral Motion Control with Constraints Satisfaction", *Pakistan Journal of Engineering & Applied Sciences*, vol. 28, pp. 1-10, Jan 2021.
6. M. N. Almani, **G. A. Hussain** and A. A. Zaher, "An Improved Technique for Energy-Efficient Starting and Operating Control of Single-Phase Induction Motors," *IEEE Access*, vol. 9, pp. 12446-12462, 2021.
7. **G. A. Hussain**, Z. Ahmad, M. Shafiq, A. Zaher, M. Lehtonen, "An adaptive De-noising Algorithm for online Condition Monitoring of High Voltage Power Equipment", *Electric Power Components and Systems (Taylor and Francis)*, vol. 48, no. 9-10, pp. 1036-1048, Oct 2020.
8. M. Shakil, Z. Rashid, **G. A. Hussain**, F. Umer, "Power Flow Analysis and Optimization in Ring Distribution Network of Bahawalpur using Newton Raphson Method", *Indian Journal of Science and Technology*, vol. 27, no. 13, pp. 2720-2732, 2020.
9. Ghulam Mujtaba, Zeeshan Rashid, Farhana Umer, Shadi Khan Baloch, **Ghulam Amjad Hussain** and Usman Haider, Implementation of distributed generation with solar panels in 132 kV substation at Layyah using ETAP, *Hindawi International Journal of Photoenergy*, vol. 2020, Article ID 6574659, Jun 2020.
10. W. Hassan, **G. A. Hussain**, F. Mahmood, S. Amin and M. Lehtonen, "Effects of Environmental Factors on Partial Discharge Activity and Estimation of Insulation Lifetime in Electrical Machines", *IEEE Access*, vol. 8, pp. 108491-108502, 2020.
11. Hassan Zahid, Farhana Umar, Zeeshan Rashid, Abdur Raheem, Rabia Shakoor, **G. Amjad Hussain**, "Critical Analysis and Application of Net-Meeting Practice in MEPCO, *Hindawi International Journal of Photoenergy*, vol. 2020, article ID: 4135860, Jun 2020.
12. **G. Amjad Hussain**, Ashraf Zaher, Detlef Hummes, M. Safdar, Matti Lehtonen, "Hybrid sensing of internal and surface Partial discharge in air-insulated medium voltage switchgear", *Energies (MDPI)*, 13, 1738, April 2020.
13. A. Zaher, D. Hummes, **A. Hussain**, "Intelligent Nonmodel-based Fault Diagnosis of Electric Motors using Current Signature Analysis", *Journal of Physics, Conference Series*, 1391(2019) 012065.
14. M. Safdar, **G. A. Hussain**, M. Lehtonen, "Cost of Demand Response from Residential Customers' Perspectives", *Energies (MDPI)*, vol. 12(9), pp. 1-16, April 2019.
15. M. Shafiq, K. Kauhaniemi, G. Robles, **G. A. Hussain**, L. Kumpulainen, , "Partial Discharge Signal Propagation in MV Branched Cable Feeder", *IEEE Electric Insulation Magazine*, vol. 34, no. 6, pp. 18-19, Nov-Dec 2018).

c. Conference Papers/Proceedings:

1. **G. A. Hussain**, W. Hassan, F. Mahmood, J. A. Kay, "Risk assessment of electrical defects in medium voltage switchgear using partial discharge diagnostics", *2022 IEEE LAS PCIC Conference*, Denver, CO, USA, September 26-29, 2022. (Accepted).
2. **G. A. Hussain**, W. Hassan, F. Mahmood, J. A. Kay, "Classification of partial discharge faults in Medium Voltage Switchgear", *2022 IEEE 40th Electrical Insulation Conference (EIC)*, Knoxville, Tennessee, USA, June 19-22, 2022.
3. W. Hassan, **G. A. Hussain**, F. Mahmood, M. Akmal, "Quantifying the Probability of Partial Discharge in VFD Fed Electric Motors Under Voltage Harmonics Concentration", *20th IEEE International Conference on Harmonics and Power Quality*, Naples, Italy, May 29th - June 1st, 2022.
4. Haresh Kumar, Muhammad Shafiq, **Ghulam Amjad Hussain**, Kimmo Kauhaniemi, "Comparison of Machine Learning Algorithms for Classification of PD Signals in Medium Voltage Components", *ISGT Europe 2021*, Espoo, Finland, 18-21 October 2021.
5. Haresh Kumar, Muhammad Shafiq, **Amjad Hussain**, Lauri Kumpulainen, Kimmo Kauhaniemi, "Classification of PD Faults using Features Extraction and K-Means Clustering Techniques", *ISGT Europe 2020*, 25-28 October 2020.
6. Muhammad Shafiq, Kimmo Kauhaniemi, **G. Amjad Hussain**, Lauri Kutt, "Electromagnetic Sensors for Online Condition Monitoring of Medium Voltage Cables", *International Conference on Sensor and Measurement Science*, Nuremberg, Germany, 22-25 June 2020, DOI: 10.5162/SMSI2020/E6.4.
7. Muhammad Shafiq, Ivar Kiitam, Paul Taklaja, **Amjad Hussain**, Lauri Kutt, Kimmo Kauhaniemi, "Characterization of corona and internal partial discharge under increasing electrical stress using time domain analysis", *IEEE Electrical Insulation Conference (EIC)*, Knoxville TN, June 07-11, 2020.
8. Ashraf Zaher, **Amjad Hussain**, "STEAM-based Active Learning Approach to Selected Topics in Electrical/Computer Engineering", *EDUCON 2020*, Porto, Portugal, April 27-30, 2020.
9. Muhammad Shafiq, Guillermo Robles, **Amjad Hussain**, Kimmo Kauhaniemi & Matti Lehtonen, "Identification and Location of Partial Discharge Defects in Medium Voltage AC Cables", *26th Nordic Insulation Symposium on Materials, Components and Diagnostics (NORD-IS 19)*, Tampere, Finland, June 12-14, 2019.
10. **G. A. Hussain**, D. Hummes, A. Zaher, M. Safdar, M. Lehtonen, "Hybrid Sensing of Partial Discharge Faults in Air Insulated Switchgear", *19th IEEE International Conference on Environment and Electrical Engineering (EEEIC)*, June 11-14, 2019, Genova, Italy.
11. A. Zaher, **A. Hussain**, "Chaos-based Cryptography for Transmitting Multimedia Data over Public Channels", *7th International Conference on Information and Communication Technology (ICoICT)*, July 24-26 2019, Kuala Lumpur, Malaysia.
12. **G. A. Hussain**, D. Hummes, M. Shafiq, M. Safdar, "Detection of Multiple Partial Discharge Faults in Switchgear and Power Cables", *IEEE Power & Energy Conference, TPEC 2019*, 7-8 Feb 2019.
13. D. Hummes, **G. A. Hussain**, B. Fruth, "Advanced Condition based Diagnostics of High Voltage Generators and Motors", *IEEE Intl. Conf. on Power & Energy*, Kuala Lumpur, Malaysia, 3-4 Dec 2018.

14. **A. Hussain**, Z. Ahmed, M. Shafiq, M. Lehtonen, “Self-Adaptive De-Noising Technique Based On Dwt For Pd Measurements And Self-Healing Networks”, *IEEE Intl. Conf. on Innovative Smart Grid Technologies (ISGT) Asia*, Singapore, 22-25 May 2018.
15. H. Al-Leythi, Z. A. Mohammed, D. Hummes, **A. Hussain**, C. Caironi and B. Fruth, “Motor Watch – Motor Fault Signature Analysis”, *Second Intl. IEEE Conference on Computing Sciences and Engineering (ICCSE)*, Kuwait, 11-13 March 2018.

d. Work-in-Progress

Currently working on the following research projects:

- Smart condition monitoring and self-healing network for power grids, funded by the Kuwait Foundation for the Advancement of Sciences- KFAS.
- Development of a simulation package for the Electric Machine Laboratory, funded by AUK.

e. Seminars and Technical Talks

1. 40th IEEE Electrical Insulation Conference (EIC), Knoxville, Tennessee, USA, June 19-21, 2022 (Presenter).
2. IEEE International Conference on Harmonics and Power Quality, Naples, Italy, May 29th to June 1st, 2022 (Presenter)
3. IEEE Power and Energy Conference, Texas (TPEC), College Station, TX, USA, 07-08 Feb 2019 (Presenter).
4. IEEE Intl. Conf. on Innovative Smart Grid Tech. (ISGT) Asia, 22-25 May 2018 (Presenter).
5. 2nd Intl. IEEE Conf. on DC Microgrid (ICDCM), Nurnberg, Germany, June 27-29 2017 (Attendee).
6. Seminar delivered on State of the Art of High Voltage Engineering Research at the University of Waterloo, Canada, June 2017 (Presenter).
7. Seminar delivered on Power System Protection and Control: Future Trends at Louisiana State University, March 2nd 2017. (Presenter)
8. Seminar on DC microgrid at Aalborg University, Denmark, 01-02 May 2017. (Attendee)
9. 57th IEEE International Conference on Power & Electrical Engineering, Riga, Latvia, Oct 13-14, 2016 (Paper presenter/ award receiver).
10. 17th IEEE International Conference on Electrical Power Engineering (EPE), Prague, Czech Republic, May 2016 (Paper presenter).
11. 62nd IEEE-IAS Petroleum and Chemical Industry Conference, Houston, USA, Oct 2015 (Attendee/ Award receiver).
12. 61st IEEE-IAS Petroleum and Chemical Industry Conference, San Francisco, USA, Sep 2014 (Paper presenter).
13. 60th IEEE- IAS Petroleum and Chemical Industry Conference USA in Chicago (USA), Sep 2013 (Paper presenter).
14. 9th IEEE-IAS Petroleum and Chemical Industry Conference Europe in Prague (Czech Republic), June 2012 (Paper presenter).

15. First Petroleum and Chemical Industry Conference Middle East in Abu Dhabi (UAE), Nov 2012 (Paper presenter).
16. IEEE International Conference on Industrial Technology (ICIT) in Cape Town (South Africa), Feb 2013 (Paper presenter).
17. Smart Energy Summer School by EIT-ICT Labs in Berlin and Paris, Aug 2013 (Attendee).
18. Smart Energy Summer School by EIT-ICT Labs in London and Karlsruhe, Sep 2012 (Attendee).
19. Seminar on Microgrids – the building block of a smarter grid, Porto, Jun 2014 (Attendee).
20. Seminar on HVDC Technology and Applications, Glasgow, December 2014 (Attendee).

9. Membership in Professional Societies

IEEE, Senior Member
 IEEE Industry Applications Society (IAS)
 IEEE Power & Energy Society (PES)

10. Patents, Honors and awards

- The best paper prize, in IEEE PCIC Conf. 2014.
- The best evaluated Author Award, in IEEE RTUCON 2016.
- Award for contribution in Electrical Safety, The Association for Electrical Safety, Finland (STEK), 2014.
- 1 patent published.

11. Courses Taught & Advising Experience

a. Courses taught at AUK:

The courses taught at AUK since Fall 2017 are listed below:

Semester	Course Code	Course Description	# of Students
Spring 2022	ELEG 300	Engineering Electromagnetics	31
	ELEG 310	Electric Machines and Power Fund.	30
	ELEG 330	Power System Analysis	47
Fall 2021	ELEG 300	Engineering Electromagnetics	28
	ELEG 310	Electric Machines and Power Fund.	26
	ELEG 330	Power System Analysis	78
	CPEG 470	Internship in Computer Engineering	1
	ELEG 470	Internship in Electrical Engineering	7
Summer 2021	ELEG 300	Engineering Electromagnetics	30
	ELEG 310	Electric Machines and Power Fund.	38
	ELEG 330	Power System Analysis	2
	ELEG 340	Fund. of High Voltage Engineering	1
	ELEG 470	Internship in Electrical Engineering	55
Spring 2021	ELEG 310	Electric Machines and Power Fund.	24
	ELEG 330-01	Power System Analysis	21
	ELEG 330-02	Power System Analysis	39
Fall 2020	ELEG 310-01	Electric Machines and Power Fund.	22
	ELEG 310-02	Electric Machines and Power Fund.	36

	ELEG 330-01	Power System Analysis	30
	ELEG 330-02	Power System Analysis	19
Summer 2020	ELEG 330	Power System Analysis	2
	ELEG 340	Fund. of High Voltage Engineering	34
	ELEG 389	Fund. of High Voltage Engineering	3
Spring 2020	ELEG 310-01	Electric Machines and Power Fund.	30
	ELEG 310-02	Electric Machines and Power Fund.	29
	ELEG 330-01	Power System Analysis	21
	ELEG 330-02	Power System Analysis	28
	ELEG 330L	Power Systems Laboratory	14
	ELEG 389	Fund. of High Voltage Engineering	2
Fall 2019	ELEG 300	Engineering Electromagnetics	28
	ELEG 301L	Programmable Logic Controllers Lab	18
	ELEG 330-01	Power System Analysis	18
	ELEG 330-02	Power System Analysis	20
	ELEG 330L-01	Power Systems Laboratory	18
	ELEG 330L-02	Power Systems Laboratory	18
Summer 2019	ELEG 300	Engineering Electromagnetics	11
	ELEG 310	Electric Machines and Power Fund.	25
	ELEG 330	Power System Analysis	13
	ELEG 330L	Power Systems Laboratory	2
	ELEG 389	Fund. of High Voltage Engineering	29
Spring 2019	CPEG 480	Senior Capstone Design II	17
	ELEG 300	Engineering Electromagnetics	18
	ELEG 330	Power System Analysis	29
	ELEG 330L-01	Power Systems Laboratory	13
	ELEG 330L-02	Power Systems Laboratory	11
	ELEG 471	Power Electronics	11
	ELEG 471L	Power Electronics Laboratory	3
Fall 2018	ELEG 300	Engineering Electromagnetics	17
	ELEG 330	Power System Analysis	30
	ELEG 330L-01	Power Systems Laboratory	13
	ELEG 330L-02	Power Systems Laboratory	10
	ELEG 389	Fund. of High Voltage Engineering	1
	ELEG 471L	Power Electronics Laboratory	14
Summer 2018	ELEG 320	Signals and Systems	9
	ELEG 388-01	Special Lab	17
	ELEG 388-02	Special Lab	18
	ELEG 389-01	Fund. of High Voltage Engineering	26
	ELEG 389-02	Power Systems Protection	25
Spring 2018	ELEG 300	Engineering Electromagnetics	22
	ELEG 330-01	Power System Analysis	19
	ELEG 330-02	Power System Analysis	12
	ELEG 330L-01	Power Systems Laboratory	18
	ELEG 330L-02	Power Systems Laboratory	12
	ELEG 389	Power Systems Protection	7
Fall 2017	ELEG 220	Electric Circuits	28
	ELEG 300	Engineering Electromagnetics	25
	ELEG 389	Fund. of High Voltage Engineering	14

b. Supervised/Co-supervised Students Work:

PhD Dissertations:

- i. Waqar Hassan, “Assessment of insulation degradation in low voltage variable frequency drives by partial discharge testing”, University of Engineering & Technology, Lahore, Pakistan, 2021. (Co-supervised)

Master Theses:

- i. Madia Safdar, “Cost of Demand response from residential customers’ perspectives”, Aalto University- School of Electrical Engg., Finland, 2019. (Co-supervised)
- ii. Zeeshan Ahmad, “Analysis and De-Noising of Partial Discharge Signals in Medium Voltage XLPE Cables”, Aalto University- School of Electrical Engg., Finland, 2016. (Co-supervised)
- iii. Madia Safdar, “Optimized residential load scheduling using demand response”, National University of Sciences & Technology, Islamabad, Pakistan, 2015. (Co-supervised)

Final Capstone Design Projects:

- i. Hybrid Bicycle (Dalal Al-Ansari, Fahad Al-Enezi, Hussain Al-Matrouk, Mohammad Al-Mesri, Fall 2021)
- ii. Car Thermoelectric Cooler (Ajwan Qabazard, Bashar Marafie, Sabika Aldawood, Sultan Al-Khaledi, Fall 2021)
- iii. Solar Bike (Awatif Edrees, Dala Alsumait, Farah AlMudhhi, Yousef Mandani, Fall 2021)
- iv. Hybrid Bicycle (Abdulrahman AlRashoud, Haider Asim, Salem Al-Rashidy, Summer 2021)
- v. Solar Hybrid Bicycle (Lina Al-Charaawi, Khaled Al-Dosari, Ebrahim Hamada, Merna Hawary, Spring 2021)
- vi. Chargeable Electric Bike (Nasser Hamammreh, Hussien Zreik, Samer Ibrahim, Abdullah Al-Kandari, Fall 2020)
- vii. Demand Side Management (Fatima Marafie, Sara Ibrahim, Raneem Jawich, Fall 2020)
- viii. Piezoelectric Power Generation (Ahmad AlRashed, Abdulrahman Al-Masoud Hussam Abu-Zayed, Fall 2019). (Co-supervised)
- ix. Prediction of Electrical Arc and Fire Prevention in Electrical Systems (Tariq Al-Haji, Wasmeia Al-Rashidi, AlKounouz Bohaimed, Nasser Dashti, Spring 2019)
- x. Wireless power transfer (Faisal Hayat, Gehan ElTayeb, Huda Al-Sehmmari, Fall 2018)
- xi. Smart battery forecasting system (Amani Almutairi, Ahmad Alabdeen, Ahmed Al-Zayed, Fall 2018)
- xii. Motor Watch- Motor Fault Signature Analysis (Haidy H. Al-Leythi, Zainab A. Mohammed, Fall 2017). (Co-supervised)

c. Student advising:

Number of students advised per semester are given below:

Semester	# of CPEG Major	# of ELEG Major
Fall 2017	31	36
Spring 2018	31	44
Fall 2018	29	46
Spring 2019	28	45
Fall 2019	27	34
Spring 2020	21	33
Fall 2020	9	33
Spring 2021	8	27
Fall 2021	4	23
Spring 2022	4	23
TOTAL	192	344

12. Other Duties

Professional Memberships

- Senior Member- IEEE, USA.
- Academic Engineers and Architects (TEK), Finland
- Professional Engineer- Kuwait Society of Engineers (KSE), Kuwait
- Professional Engineer- Pakistan Engineering Council (PEC), Pakistan

Professional Services:

- Reviewer for IEEE Transactions on Power Delivery
- Reviewer for IEEE Transactions on Power Systems
- Reviewer for IEEE Transactions on Instrumentation and Measurement
- Reviewer for International Journal of Electrical Power & Energy Systems
- Reviewer for Measurement (Journal of the International Measurement Confederation)
- Reviewer for Energies (Journal from MDPI)
- Reviewer for Sensors (Journal from MDPI)

University Services:

AY 2021-2022

- ABET Steering Committee, Member
- College (CEAS) Dean's Council, Member
- College (CEAS) Resource Management and Planning, Chair
- College (CEAS) Curriculum and Assessment, Member
- College (CEAS) Industry Advisory Board, Member & Secretary
- College (CEAS) ABET Accreditation Committee, Member

AY 2020-2021

- University Research Board, Member
- University Computing and Technology Committee, Member
- University's Emergency Planning Committee, Member
- ABET Steering Committee, Member
- College (CEAS) Resource Management and Planning, Chair

- College (CEAS) Curriculum and Assessment, Member
- College (CEAS) Industry Advisory Board, Member & Secretary,
- College (CEAS) ABET Accreditation Committee, Member

AY 2019-2020

- University Research Board, Member
- Department's Project Evaluation Committee, Chair
- Department's Research Committee, Chair
- Department's Industry Advisory Board, Member
- Department's Course Assessment Committee, Member
- Department's Curriculum Guide Committee, Member
- Department's Budget Committee, Member
- Department's Student Liaison Committee, Member

AY 2018-2019

- University's Professional Development Committee, Member
- College Grade Appeal Committee, Member
- Department's Project Evaluation Committee, Chair
- Department's Research Committee, Member
- Department's Industry Advisory Board, Member
- Department's Course Assessment Committee, Member
- Department's Curriculum Guide Committee, Member
- Department's Budget Committee, Member
- Department's Student Liaison Committee, Member

Contribution to ABET Accreditation:

Contributed continuously to ABET Accreditation since joining AUK (2017) to improve ELEG curriculum, revamp labs, offering new courses and lab, and involving students in curricular and extracurricular activities. Moreover, co-written criteria 3 and 4 of ABET self-study report.

13. Research Grants

- Research Grant, Co-Investigator, American University of Kuwait (AUK), May 2021- for one year, value 2452 KWD.
- Research Grant, Principal Investigator, Kuwait Foundation for Advancement of Sciences, March 2019- for three years, value 10000 KWD.
- Research Grant, The Finnish Cultural Foundation, Finland, February 2015, value 20000 Euro.
- Research Grant, The Finnish Cultural Foundation, Finland, February 2014, value 20000 Euro.
- Research Grant, The Finnish Foundation for Technology Promotion, Finland, April 2012, value 22000 Euro.

14. Links

Google Scholar: <https://scholar.google.com/citations?user=TFF1GrYAAAAJ&hl=en>

Linkedin: <https://www.linkedin.com/in/dr-amjadhussain/>