

# DR ZOHAIB AKHTAR

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## PROFILE:

An experienced academic with research and teaching experience of nine years as a Lecturer/Assistant Professor and four years as a Research Post-graduate/Graduate Teaching Assistant.

## MEMBERSHIPS:

Senior Member IEEE (SMIEEE), Fellow of The Higher Education Academy (FHEA), Member IET (MIET), Chartered Engineer (CEng) Engineering Council UK, Professional Engineer (PE) Pakistan Engineering Council

## EDUCATION:

- Sep 2021 -to- Aug 2022 **POST-GRADUATE DIPLOMA (PG-DIP), UNIVERSITY LEARNING AND TEACHING, IMPERIAL COLLEGE LONDON, UNITED KINGDOM**
- MODULES: Engaging with Educational Literature, Writing Critically in Education, Library Project
- Sep 2019 -to- Aug 2020 **POST-GRADUATE CERTIFICATE (PG-CERT), UNIVERSITY LEARNING AND TEACHING, IMPERIAL COLLEGE LONDON, UNITED KINGDOM**
- MODULES: How Students Learn, Educational Supervision, Digital Learning, Assessment and Feedback, Reflection on Changing Practice
- Sep 2013 -to- Nov 2017 **DOCTOR OF PHILOSOPHY (PHD) AND DIPLOMA OF IMPERIAL COLLEGE (DIC), ELECTRICAL AND ELECTRONIC ENGINEERING, IMPERIAL COLLEGE LONDON, UNITED KINGDOM**
- RESEARCH GROUP: **Control and Power**
  - THESIS TITLE: **Distributed Voltage Control and Demand Response**
  - SUPERVISOR: **Dr Balarko Chaudhuri**
- Nov 2008 -to- Oct 2011 **MASTER OF SCIENCE (MSc), ELECTRICAL ENGINEERING, UNIVERSITY OF ENGINEERING AND TECHNOLOGY (UET), LAHORE, PAKISTAN\***, AND **UNIVERSITY OF PADERBORN, GERMANY (SPLIT RESEARCH)**
- \*UET Lahore is the oldest, largest, and top-ranked public sector engineering university in Pakistan
- SPECIALIZATION: **Power Systems**
  - THESIS TITLE: **Design of Protection Scheme for Microgrids with Multiple Distributed Generation Units**
  - SUPERVISOR: **Prof M.A. Saqib**
  - PERCENTAGE MARKS: **90.20 %**
- Sep 2004 -to- Aug 2008 **BACHELOR OF SCIENCE WITH HONOURS (BSC HONS), ELECTRICAL ENGINEERING, UNIVERSITY OF ENGINEERING AND TECHNOLOGY (UET), LAHORE, PAKISTAN**
- SPECIALIZATION: **Power Systems**
  - PERCENTAGE MARKS: **88.98 % (Ranked 1<sup>st</sup> out of 130 students)**
  - **GOLD MEDAL**: Awarded a **Gold Medal** by the Prime Minister of Pakistan for securing 1<sup>st</sup> position in Electrical Engineering specialization in Power Systems on the 19<sup>th</sup> Convocation of UET Lahore

## REFEREED JOURNAL PUBLICATIONS:

GOOGLE SCHOLAR PROFILE: <https://scholar.google.com/citations?hl=en&user=LQJVXVQAAAAJ>

1. **Z. Akhtar**, "Reduction in Energy Storage Requirements for DC/AC Microgrids by Using Power Electronic Compensators," IEEE Transactions on Smart Grid, (Manuscript under-review, 2021).
2. **Z. Akhtar**, M. Opatovsky, B. Chaudhuri, and S. Y. R. Hui, "Comparison of Point-of-Load vs Mid Feeder Compensation in LV Distribution Networks with High Penetration of Solar Photovoltaic Generation and Electric Vehicle Charging Stations," IET Smart Grid, vol. 2, issue 2, pp. 283-292, 2019. DOI: [10.1049/iet-stg.2018.0193](https://doi.org/10.1049/iet-stg.2018.0193)
3. **Z. Akhtar**, B. Chaudhuri, and S. Y. R. Hui, "Smart Loads for Voltage Control in Distribution Networks," IEEE Transactions on Smart Grid, vol. 8, issue 2, pp. 937-946, 2017. DOI: [10.1109/TSG.2015.2486139](https://doi.org/10.1109/TSG.2015.2486139)
4. **Z. Akhtar**, and M. A. Saqib, "Microgrids Formed by Renewable Energy Integration into Power Grids Pose Electrical Protection Challenges," Renewable Energy, vol. 99, pp. 148-157, 2016. DOI: [10.1016/j.renene.2016.06.053](https://doi.org/10.1016/j.renene.2016.06.053)
5. **Z. Akhtar**, B. Chaudhuri, and S. Y. R. Hui, "Primary Frequency Control Contribution from Smart Loads Using Reactive Compensation," IEEE Transactions on Smart Grid, vol. 6, issue 5, pp. 2356-2365, 2015. DOI: [10.1109/TSG.2015.2402637](https://doi.org/10.1109/TSG.2015.2402637)

6. X. Luo, **Z. Akhtar**, C. K. Lee, B. Chaudhuri, S. C. Tan, and S. Y. R. Hui, "Distributed Voltage Control with Electric Springs: Comparison with STATCOM," IEEE Transactions on Smart Grid, vol. 6, issue 1, pp. 209-219, 2015. DOI: [10.1109/TSG.2014.2345072](https://doi.org/10.1109/TSG.2014.2345072)

## CONFERENCE PUBLICATIONS:

1. **Z. Akhtar**, S. Alavi, and K. Mehran, "Voltage Control in LV Networks Using Electric Springs with Coordination," in 31<sup>st</sup> Annual IEEE Canadian Conference on Electrical and Computer Engineering (CCECE), Québec City, Canada, 13-16 May 2018. DOI: [10.1109/CCECE.2018.8447586](https://doi.org/10.1109/CCECE.2018.8447586)
2. **Z. Akhtar**, B. Chaudhuri, and S. Y. R. Hui, "Smart Loads for Voltage Control in Distribution Networks," in 2016 IEEE Power and Energy Society General Meeting (PESGM), Boston MA, USA, 17-20 July 2016. DOI: [10.1109/PESGM.2016.7741958](https://doi.org/10.1109/PESGM.2016.7741958)
3. L. Xiao, **Z. Akhtar**, L. Chi Kwan, B. Chaudhuri, T. Siew-Chong, and S. Y. R. Hui, "Distributed Voltage Control with Electric Springs: Comparison with STATCOM," in 2016 IEEE Power and Energy Society General Meeting (PESGM), Boston MA, USA, 17-20 July 2016. DOI: [10.1109/PESGM.2016.7741963](https://doi.org/10.1109/PESGM.2016.7741963)
4. D. Chakravorty, **Z. Akhtar**, B. Chaudhuri, and S. Y. R. Hui, "Comparison of Primary Frequency Control Using Two Smart Load Types," in 2016 IEEE Power and Energy Society General Meeting (PESGM), Boston MA, USA, 17-20 July 2016. DOI: [10.1109/PESGM.2016.7742050](https://doi.org/10.1109/PESGM.2016.7742050)
5. **Z. Akhtar**, B. Chaudhuri, and S. Y. R. Hui, "Poster: Smart Loads for Voltage Control in Distribution Networks," in 2015 IEEE Power and Energy Society General Meeting (PESGM), Denver CO, USA, 26-30 July 2015. [Web-Link](#)
6. **Z. Akhtar**, B. Chaudhuri, and S. Y. R. Hui, "Poster: Distributed Voltage and Frequency Control Using Electric Springs," in 2014 IEEE Power and Energy Society General Meeting (PESGM), National Harbor MD, USA, 27-31 July 2014. [Web-Link](#)

## WORK EXPERIENCE:

### A. TEACHING EXPERIENCE:

Aug 2020 -to- Present

SENIOR TEACHING FELLOW, [IMPERIAL COLLEGE LONDON, UNITED KINGDOM](#)

- Teaching theory classes, laboratory sessions, and personal tutorials
- Leading remote teaching committee during the Covid-19 pandemic
- Designing remote and virtual laboratories
- Supervising one PhD student
- Supervising MSc / MEng theses and industrial placements
- Managing WiseFlow based online assessments in the department
- Analyzing data to evaluate the impact of pedagogic transformation on teaching and learning
- Working with the department's IT and the educational teams to contribute to the development of the departmental IT strategy and policy

Oct 2017 -to- Aug 2020

STRATEGIC TEACHING FELLOW, [IMPERIAL COLLEGE LONDON, UNITED KINGDOM](#)

- Taught theory classes and laboratory sessions
- Managed 2<sup>nd</sup> year electronics laboratory
- Supervised MSc / MEng theses and industrial placements
- Conducted personal tutorials focused on pastoral care
- Reviewed curriculum for the department by determining the learning outcomes of all modules
- Highlighted the links between different modules based on their learning outcomes which were vital for revising the curriculum
- Managed Blackboard (VLE) for the department

Sep 2013 -to- Aug 2017

GRADUATE TEACHING ASSISTANT, [IMPERIAL COLLEGE LONDON, UNITED KINGDOM](#)

- Demonstrated laboratory sessions for Switch Mode Power Supply experiment
- Conducted individual interviews with students as part of their final assessment
- Taught 1<sup>st</sup> and 2<sup>nd</sup> year Mathematics tutorials
- Evaluated Professional Engineering course presentations and reports

Sep 2008 -to- Sep 2013

LECTURER / ASSISTANT PROFESSOR, [UNIVERSITY OF ENGINEERING AND TECHNOLOGY \(UET\), LAHORE, PAKISTAN](#)

- UET is the biggest, largest, and top-ranked public sector engineering university in Pakistan
- Started as a Lecturer in Sep 2008 and was promoted to an Assistant Professor in Dec 2012
- Taught theory classes and laboratory sessions for the following electrical engineering courses:
  - 1<sup>st</sup> Year: Circuit Analysis and Design
  - 2<sup>nd</sup> Year: AC and DC Machines
  - 3<sup>rd</sup> Year: Power Transmission and Distribution

- 4<sup>th</sup> Year: Electric Machine Design, Power System Protection, Power Systems Operation and Control, and High Voltage Engineering
- Supervised 4<sup>th</sup> year projects
- Conducted insulation tests in the department high voltage laboratory
- Organized department timetable

## B. RESEARCH EXPERIENCE:

- March 2021 -to- Present    **PHD STUDENT SUPERVISOR, IMPERIAL COLLEGE LONDON, UNITED KINGDOM**
- **THESIS TITLE:** Stability Assessment and Enhancement of Power Systems Dominated by Inverter Based Resources Dominated
  - Solving the weak-grid instability problem which poses a threat to the sustainable operation of futuristic power systems
  - Design optimal control parameters on both AC and DC sides of VSC that ensures smooth operation of the power system
  - Design a coordination strategy among multiple converters to provide highly reliable power operations and market participation
- Aug 2018 -to- Dec 2018    **POST-DOCTORAL RESEARCH ASSOCIATE (PART-TIME), QUEEN MARY UNIVERSITY LONDON, UNITED KINGDOM**
- Worked on development of multi-physics sensor array for power electronic converter prognostics for electric vehicles
  - Created a sensing platform to quantify the health status of power electronic modules within electric vehicle drive systems, using an array of multi-physical sensors to generate a spatially sparse IMAGE of measurements. This IMAGE consists of temperature, electrical quantities (V, I, Z), mechanical displacement (wire bond movement/device deformity) at different time scales
  - Collaborated with four universities and two industrial partners
- Nov 2017 -to- Apr 2018    **POST-DOCTORAL RESEARCH ASSOCIATE (PART-TIME), QUEEN MARY UNIVERSITY LONDON, UNITED KINGDOM**
- Developed control strategies for autonomous control of AC/DC microgrids with energy storage and power electronic compensators for voltage and frequency control
  - Completed the project on the coordination of power electronic compensators in a distribution system
  - Provided guidance and supervision to PhD students working in the research group
- Sep 2013 -to- Sep 2017    **RESEARCH POSTGRADUATE, IMPERIAL COLLEGE LONDON, UNITED KINGDOM**
- Developed an integrated approach to voltage and frequency control and demand response in distribution networks by autonomous control of power electronic compensators to increase the number of renewable energy units and electric vehicle charging stations in a power system
  - Reviewed papers for IEEE Transactions on Smart Grids, IEEE Transactions on Power Delivery and IEEE Transactions on Sustainable Energy
  - Co-supervised MSc/MEng theses
- Sep 2009 -to- Feb 2010    **RESEARCH ASSISTANT, UNIVERSITY OF PADERBORN, GERMANY**
- Worked in LEA Laboratory (Power Electronics and Electrical Drives lab)
  - Participated in the research for the development of a Linear Rail Cab System using linear induction motor technology, and supercapacitors/batteries hybrid energy systems
- Jun 2008 -to- Sep 2008    **RESEARCH ENGINEER, PAK ELEKTRON LIMITED (PEL), PAKISTAN**
- Developed an empirical formula for the calculation of stray losses in power transformers
  - Worked on high-frequency modelling of power transformers for optimal insulation calculations

## AWARDS AND HONOURS:

- Aug 2021    **INSPIRATION AWARD 2021:** Won Inspiration Award for outstanding efforts to help the Electrical and Electronic Engineering Department's transition to online teaching and learning. [Web-link](#)
- TEAMWORK / COLLABORATION AWARD 2021:** Won a Teamwork/Collaboration team member of Project Design Team to develop a remote 2<sup>nd</sup> year project. [Web-link](#)
- May 2021    **NOMINATION FOR PRESIDENT'S AWARD FOR EXCELLENCE:** Nominated for President's Award for Excellence in Supporting the Student Experience. [Web-link](#)
- Dec 2020    **COLLABORATION AWARD 2020:** Won a Collaboration Award as a Lab-in-a-box Design and Strategy Team member that designed various 'Lab-in-a-Box' experiments for remote learning and teaching. [Web-link](#)

Sept 2020	<p><b>TEAMWORK AWARD 2020:</b> Won a Teamwork Award as a member of the Curriculum Review Team for redesigning the curriculum for undergraduate programs in the department. <a href="#">Web-link</a></p> <p><b>TEAMWORK AWARD 2020:</b> Won a Teamwork Award as a member of the Remote Assessment Team for conducting remote assessments during the Covid 19 pandemic. <a href="#">Web-link</a></p>
Sep 2013 -to- Sep 2016	<p><b>COMMONWEALTH SCHOLARSHIP AWARD:</b> Received the prestigious Commonwealth Scholarship for pursuing a PhD in Electrical Engineering at Imperial College London. Only 5 PhD scholars were selected for the award out of more than 800 applicants from Pakistan.</p>
Jul 2014, Jul 2015, Jul 2016	<p><b>TRAVEL GRANTS:</b></p> <ul style="list-style-type: none"> <li>• 2016 IEEE Power and Energy Society General Meeting, Washington, DC, USA</li> <li>• 2015 IEEE Power and Energy Society General Meeting, Denver, CO, USA</li> <li>• 2014 IEEE Power and Energy Society General Meeting, Boston, MA, USA</li> </ul>
Sep 2012	<p><b>SOCIAL SECRETARY, TEACHING (ACADEMIC) STAFF ASSOCIATION:</b> Elected as the Social Secretary for the UET Lahore Teaching (Academic) Staff Association by securing 308 out of 450 votes from academic staff members.</p>
Jul 2012	<p><b>BEST TEACHER:</b> Ranked 1<sup>st</sup> out of 43 Department of Electrical Engineering teachers based on the teacher evaluation feedback from undergraduate students at UET Lahore.</p>
Dec 2010	<p><b>GOLD MEDAL:</b> Awarded a Gold Medal by the Prime Minister of Pakistan for securing 1<sup>st</sup> position in Electrical Engineering specialization in Power Systems on the 19<sup>th</sup> Convocation of UET Lahore.</p>
Sep 2009 -to- Feb 2010	<p><b>EURECA – (EUROPEAN RESEARCH AND EDUCATIONAL COLLABORATION WITH ASIA):</b> Research grant to carry out postgraduate research at University of Paderborn, Germany.</p>

## REFERENCES:

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| <p>1. Dr Balarko Chaudhuri<br/>Reader, Electrical and Electronic Engineering<br/>Imperial College London, United Kingdom</p>                | <p>Email: <a href="mailto:b.chaudhuri@imperial.ac.uk">b.chaudhuri@imperial.ac.uk</a><br/>Office: +44-(0)20-7594-6196</p> |
| <p>2. Prof Ron S.Y. Hui<br/>Chair in Power Electronics, Electrical and Electronic Engineering<br/>University of Hong Kong, Hong Kong</p>    | <p>Email: <a href="mailto:ronhui@eee.hku.hk">ronhui@eee.hku.hk</a><br/>Office: +852-2859-2706</p>                        |
| <p>3. Mrs Esther Perea<br/>Principal Teaching Fellow, Electrical and Electronic Engineering<br/>Imperial College London, United Kingdom</p> | <p>Email: <a href="mailto:e.perea@imperial.ac.uk">e.perea@imperial.ac.uk</a><br/>Office: +44-(0)20-7594-6160</p>         |