

# Dr. Syed Quadir Hussain Quadri

Assistant Professor, Electrical Engineering Department  
NED University of Engineering and Technology

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## PROFILE SUMMARY:

I received B.E. degree in Electrical Engineering from the NED University of Engineering and Technology, Karachi, Pakistan, in 2009. I completed my M.Sc. degree in power electronics and drives and Ph.D. degree in electrical engineering from the University of Nottingham, Nottingham, U.K., in 2012 and 2020, respectively, under the scholarships awarded by the University of Nottingham.

Since 2013, I have been working in academia and research, starting as a lecturer in the electrical engineering department at DHA Suffa University, Karachi, Pakistan, till 2014. From 2014 till 2017, I worked as a Teaching Assistant at University of Nottingham whilst working on my Ph.D. studies, where I also supervised M.Sc. projects. After Ph.D., I have been working as a Senior Research Fellow in NED University of Engineering and Technology for EV design project. I then joined the electrical engineering faculty of NED University of Engineering and Technology since 2022, as an Assistant Professor.

My expertise is on electrical drives and specifically on electrical machine design, analysis and modelling using electromagnetic FEA software. My research interest lie in the area of electrical machine design focusing on design optimisation, novel unconventional topologies of motors and generators, challenges of high speed machines, accurate high frequency loss evaluations, accurate modelling techniques using subdomain modelling, finite element and multi-physics techniques, generator optimisation and impactful topologies for non-renewable and renewable generation applications and fault-tolerant designs of electrical machines. I also work on providing consultation for designing and optimising cost-effective conventional machine design solutions for commercial applications.

## QUALIFICATIONS:

**PhD Electrical and Electronic Engineering** **2020**  
**University of Nottingham, UK**

PhD Thesis: On the Analysis and Modelling of the effects of High Frequency Harmonics on Classical Synchronous Generators

- Industrially linked research project with Cummins Generator Technologies.
- Performed electrical machine analysis on electromagnetic finite element analysis (FEA) and MATLAB/Simulink software.
- Developed machine sizing and designing tool.
- Designed and developed instrumented test-rig for electrical machine testing.

**MSc. Power Electronics and Drives – First-Class (Distinction)** **2012**  
**University of Nottingham, UK**

- MSc. dissertation: Fast dynamics V/f sensorless control of permanent magnet synchronous motor (PMSM), based on FEA Model.
- Gained skills and knowledge in FEA modelling software, machine design optimisation, vector control systems for motor drives and actuation.

**B.E. Electrical Engineering - 1<sup>st</sup> Division** **2009**  
**NED University of Engineering and Technology**

## PROFESSIONAL EXPERIENCE:

**2022 till date**                      **Assistant Professor, Electrical Engineering Department**  
**NED University of Engineering and Technology**

- 2021 to 2022**      **Senior Research Fellow**  
**NED University of Engineering and Technology**
- Design, analyse, manufacture and test motors for electric vehicle applications.
- March till Sept 2021**    **Visiting Faculty**  
**NED University of Engineering and Technology**
- Planned and conducted course of Control System Design for third year undergrad students.
- 2014 to 2017**      **Teaching Assistant**  
**University of Nottingham, Nottingham, UK**
- Conducted undergraduate and postgraduate labs on the following subjects:
    - Electrical machines analysis using FEA software.
    - Power electronics (Switched mode power supply and rectifier circuits).
    - Microcontroller programming using C language.
- 2013 to 2014**      **Lecturer, Electrical Engineering Department**  
**DHA Suffa University, Karachi, Pakistan**
- Designed course outline for courses of Bachelor's in Electrical Engineering.
  - Active member in planning road map and courses for the Bachelor's degree in Electrical Engineering.
  - Delivered lectures for first year undergraduate modules of Basic Electronics and Introduction to Computer Programming (C++).
  - Advised students concerning courses as a class advisor.
- 2010 to 2011**      **Assistant Manager**  
**Karachi Electric Supply Company**
- Responsible for identifying, removing and evaluating line losses.
  - Managed, motivated and worked with site inspection teams in a competitive environment to minimise and recover losses.
  - Consistently achieved monthly targets in recovering losses.
  - Communicated convincingly with consumers in matters of revenue recovery.
  - Participated in a major energy conservation awareness program and presented methods of saving energy in a public venue.

## RESEARCH INTERESTS:

- Novel electrical machines topologies
- Integrated electrical drive systems for electrical and hybrid vehicles
- Electrical generator design and drive system for wind energy
- Magnetic gears
- Efficient analytical modelling and optimisation tooling for electrical machines.
- Electrical actuation and propulsion systems
- Efficient electrical drives and machines for home appliances
- Axial, radial (hybrid) and transverse flux machines.
- Electrical machines winding configurations and types for loss minimisation and power density.
- Fault-tolerant drive systems and machines

## PUBLICATIONS:

- "Modelling of Classical Synchronous Generators Using Size-Efficient Lookup Tables with Skewing Effect," in IEEE Access, 2019.
- "Analysis and Modelling of High Frequency Effects on Synchronous Generator's Armature Conductors," in 29<sup>th</sup> IEEE International Symposium on Industrial Electronics (ISIE), 2020.
- "Design of an Integrated Inductor for 45kW Aerospace Starter-Generator," in IEEE Transport Electrification Conference and Expo, 2018.

## **FUNDED PROJECTS:**

2022 till date **Co-PI**, EV Systems Development, Industrial Funded Project, AI Mobility and Green Energy (AIM-GE) LLC, USA.

## **MEMBERSHIPS:**

- Pakistan Engineering Council member
- Reviewer of IEEE Transactions on Transportation Electrification

## **RELEVANT SKILLS:**

- Electromagnetic finite element analysis software (experience in MagNet, Motor-CAD and JMAG).
- MATLAB & Simulink.
- PLECS for power electronics circuit design and simulations.
- C++ programming language.
- PSim, Multisim and LT Spice.
- MS-Office.

## **ACHIEVEMENTS/AWARDS:**

### **Academic:**

- Awarded the best paper of the session in IEEE ISIE 2020 conference.
- Awarded 100% tuition fee scholarship for PhD by the University of Nottingham.
- Received a scholarship award of tuition fees for Master's in University of Nottingham by Developing Solutions Scholarship.

### **Sports:**

- Captain of university's departmental hockey team in NED University and school hockey team in St. Mary's Catholic High School.
- Won gold medals at the annual NED University Interdepartmental Games in the year 2008 and 2009 for Electrical Engineering Department in hockey.
- Merit certificates for winning or being the runners-up of several inter-school hockey tournaments played during school life.