



Advanced Power Electronics Applications in Modern Electric Power Systems

Offer Description:

Applications are invited for a fully funded four-year PhD position within the School of Electrical & Electronic Engineering at University College Dublin (UCD) on *Advanced Power Electronics Applications in Modern Electric Power Systems*.

Project Description:

The increasing integration of renewable energy sources, electric vehicles, and energy storage systems into modern power grids has created new challenges and opportunities in power electronics and electric power systems. This PhD project aims to develop innovative power electronic solutions to enhance the efficiency, stability, and reliability of electric power networks.

The research will focus on: **Advanced Power Converters:** Design and control of high-performance converters for the grid integration of renewable energy sources. **Power System Stability & Control:** Investigation of power electronics-based solutions for voltage and frequency regulation. **Grid-Forming and Grid-Following Inverters:** Development of novel control strategies for non-synchronous renewable energy integration. **Power Quality Improvement:** Mitigation of harmonics, flicker, and other power quality issues using advanced converter topologies. **Energy Storage Integration:** Optimisation of battery energy storage systems in smart grids.

Funding Information:

This full-time PhD position is fully funded by the School of Electrical & Electronic Engineering at University College Dublin for a period of up to four years. The funding includes a tax-free stipend of €22,000 per annum, in addition to coverage of student fees.

Candidate Profile:

The ideal candidate should have a strong background in power electronics, electrical power systems, or related fields. Experience with MATLAB/Simulink, PLECS, or similar simulation tools, as well as knowledge of power converter design and control, would be beneficial.

This project will contribute to the development of next-generation power electronics technologies for future sustainable and resilient energy systems.

Entry Requirements:

A strong academic foundation, with a minimum 2.1 honours degree in Electrical Engineering, or related disciplines.

English Language Proficiency. Non-native English speakers require at least:

A minimum score of 90 in the Internet-based TOEFL (iBT), with no less than 21 in writing and at least 19 in every other section, or, An average IELTS score of 6.5 over all components and a minimum of 6.0 in each band on the Academic Version.

Highly Desirable Qualities:

A Master's degree with research experience.

Expertise or familiarity with power electronic converters and renewable energy sources.

Experience with high-performance computing infrastructures.

Contributions to open-source projects, demonstrating proficiency in version control and collaborative coding.

Excellent problem-solving skills, self-motivation, and the ability to work well both independently and as part of a team.

Demonstrated academic writing skills and the ability to effectively communicate research findings through papers, presentations, and other scholarly communications.

Proven willingness to learn and a strong commitment to personal and professional growth, with a track record of acquiring new skills.

Equality, Diversity, and Inclusion:

UCD is committed to creating an inclusive environment where diversity is celebrated and everyone is afforded equality of opportunity. To that end, the university adheres to a range of equality, diversity, and inclusion policies. We encourage applicants to consult those policies here <https://www.ucd.ie/equality/>. We welcome applications from everyone, including those who identify with any of the protected characteristics that are set out in our Equality, Diversity and Inclusion policy.

How to Apply:

Please submit the following documents to Dr Hamed Heydari-Doostabad via email hamed.heydari-doostabad@ucd.ie in PDF format, using the subject line “**PhD: Advanced Power Electronics Applications in Modern Electric Power Systems**”:

- 1- Résumé/Curriculum Vitae.
- 2- A cover letter (maximum two pages) including a description of the applicant's research interests and reasons for applying for the position. The cover letter must clearly indicate how the applicant's profile and skills align with the requirements of this PhD position.
- 3- A research statement (maximum two pages) outlining the applicant's vision for the proposed research scope, with a brief description of their suitability for the research.
- 4- At least two recommendation letters or contact details of two referees.
- 5- Scanned copies of all academic transcripts and English language certificates.
- 6- Complete applications will be reviewed on a rolling basis until the position is filled.

Application Deadline:

7th March 2025, 5 pm GMT.

Start Date:

The position is available to start **immediately** or as early as possible, with the start date of **May 2025 or September 2025**.

Interview:

The interview will be conducted online via Zoom or Skype in mid-March 2025.