**PhD Project Proposal**

School of Electronics, Electrical Engineering and Computer Science

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| **Proposed Project Title: Power Electronics Interface for Integrating Wind turbines into the Medium Voltage Distribution System** |
| **Principal Supervisor: Dr Ahmad Elkhateb Second Supervisor: Prof D John Morrow** |
| **Project Description:**  In this project, a study on advanced modular power converter topologies that are applied to medium voltage DC grid will be attempted. The aim will be focused on the distribution grid networks. The project includes design, control, simulation, and hardware implementation for modular power converter. The research will classify some potential improvements from utilising modular power topologies. The outcome is envisaged to propose a converter to integrate distributed systems into the medium voltage DC grid. The methodology of the research will include two components: the converter level design and the system level integration. Modulation and control methods will be developed to ensure the followings: soft-switching over wide operating range for high efficiency, uniform heat distribution for easier thermal management, and stable operation during normal and abnormal conditions. MATLAB/PLECS will be used in all device studies, design of control systems and modulation technique. Then, a laboratory scale prototype will be implemented to test the converter, and to validate its performance at system level. |
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