STAFF PROFILE

Associate Professor Brendan McGrath

Position: Associate Professor

College / Portfolio: School of Engineering Cluster

School / Department: Electrical and Biomedical Engineering

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Campus: Melbourne City Campus

Contact me about: Research supervision

Overview

Research

Dr McGrath ’s research addresses fundamental questions concerning the modulation and control of power electronic conversion systems. He has made a significant contribution to the understanding of multilevel converters, including the fundamental modulation principles and dynamic control problems such as natural balancing mechanisms. Particular research interests include:

Modulation theory for power electronic systems.

Advanced converter topologies, such as multilevel and current-fed converters.

High performance closed loop control and dynamic modelling of power electronic systems.

Power electronic applications, including motor drives, DC-DC converters for battery chargers and grid connected inverters.

Key Activities

Senior lecturer in the School of Electrical and Computer Engineering

Program director:

- Bachelor of Engineering (Electrical) – BH075
- Bachelor of Engineering (Electrical) / Bachelor of Business (Management) – BH081
- Bachelor of Engineering (Electrical) / Bachelor of Commerce – BH083

Qualifications

PhD Monash 2003

BE(Hons) Monash 1997

BSc Monash 1997

GCertHighEd Monash 2010

Industry Experience

Awards

Recipient of the Douglas Lampard research medal from Monash University, 2004.

Professional affiliations

Member of the IEEE and the following societies within this body:

Industry Applications Society (IAS)

Power Electronics Society (PELS)

Industrial Electronics Society (IES)

Associate editor for the IEEE Transactions on Industry Applications

Associate editor for the IEEE Transactions on Industrial Informatics

Employment history

May 2010 – present, Senior lecturer : School of Electrical and Computer Engineering, RMIT University

2010, Senior lecturer : Dept. of Electrical and Computer Systems Engineering, Monash University

2007 – 2010, Lecturer : Dept. of Electrical and Computer Systems Engineering, Monash University

2005 – 2007, Lecturer : School of Electrical Engineering and Computer Science, The University of Newcastle.

Publications

du Toit Mouton, H.,Cox, S.,McGrath, B.,Risbo, L.,Putzeys, B. (2018). Small-signal analysis of naturally-sampled single-edge PWM control loops (http://researchbank.rmit.edu.au/list/?cat=quick_filter&form_name=adv_search&search_keys%5Bcore_66%5D=2006078826) In: *IEEE Transactions on Power Electronics*, 33, 51 - 64

Sun, Y.,Teixeira, C.,Holmes, G.,McGrath, B.,Zhao, J. (2018). Low-order circulating current suppression of PWM-based modular multilevel converters using DC-link voltage compensation (http://researchbank.rmit.edu.au/list/?cat=quick_filter&form_name=adv_search&search_keys%5Bcore_66%5D=2006078828) In: *IEEE Transactions on Power Electronics*, 33, 210 - 225

Rodriguez Guerra, J.,Holmes, G.,McGrath, B.,Wilkinson, R. (2018). A self-triggered pulsed-mode flyback converter for electric field energy harvesting (http://researchbank.rmit.edu.au/list/?cat=quick_filter&form_name=adv_search&search_keys%5Bcore_66%5D=2006081738) In: *IEEE Journal of Emerging and Selected Topics in Power Electronics*, 6, 377 - 386

Patel, R.,Li, c.,Yu, X.,McGrath, B. (2018). (In Press) Optimal automatic generation control of an interconnected power system under network constraints In: *IEEE Transactions on Industrial Electronics*, , 1 - 9

Meegahapola, L.,Ullah Nutkani, I.,McGrath, B.,Holmes, D. (2017). Fault ride-through capability of hybrid AC/DC microgrids during AC and DC network faults (http://researchbank.rmit.edu.au/list/?

cat=quick_filter&form_name=adv_search&search_keys%5Bcore_66%5D=2006079734) In: *2017 IEEE Energy Conversion Congress and Exposition (ECCE)*, Cincinnati, United States, 1-5 October 2017

McGrath, B.,Holmes, G. (2017). Anti-windup control for stationary frame current regulators using digital conditioning architectures (http://researchbank.rmit.edu.au/list/?cat=quick_filter&form_name=adv_search&search_keys%5Bcore_66%5D=2006079739) In: *2017 IEEE Energy Conversion Congress and Exposition (ECCE)*, Cincinnati, United States, 1-5 October 2017

Patel, R.,Li, C.,Wang, L.,McGrath, B.,Yu, X. (2017). Frequency regulation using optimal demand and governor response in a deregulated environment (http://researchbank.rmit.edu.au/list/?cat=quick_filter&form_name=adv_search&search_keys%5Bcore_66%5D=2006081094) In: *Proceedings of the 43rd Annual Conference o the IEEE Industrial Electronics Society (IECON 2017)*, Beijing, China, 29 October - 1 November 2017

Nazib, A.,Holmes, G.,McGrath, B. (2017). High bandwidth sensorless synchronisation strategies for current regulated grid connected converters (http://researchbank.rmit.edu.au/list/?cat=quick_filter&form_name=adv_search&search_keys%5Bcore_66%5D=2006081815) In: *2017 Australasian Universities Power Engineering Conference (AUPEC)*, Melbourne, Australia, 19-22 November 2017

Ganeshan, A.,Holmes, G.,Meegahapola, L.,McGrath, B. (2017). Enhanced control of a hydrogen energy storage system in a microgrid (http://researchbank.rmit.edu.au/list/?cat=quick_filter&form_name=adv_search&search_keys%5Bcore_66%5D=2006081816) In: *Proceedings of the Australasian Universities Power Engineering Conference (AUPEC 2017)*, Melbourne, Australia, 19-22 November 2017

McNabb, L.,Wang, L.,McGrath, B. (2017). Intrinsically stable realization of a resonant current regulator for a single phase inverter (http://researchbank.rmit.edu.au/list/?cat=quick_filter&form_name=adv_search&search_keys%5Bcore_66%5D=2006081819) In: *Proceedings of the 11th Asian Control Conference (ASCC 2017)*, Gold Coast, Australia, 17-20 December 2017

View more outputs from this academic in the RMIT Research Repository

(http://researchbank.rmit.edu.au/list/author_id/1317180)

Grants

Advanced inverter control for distributed energy systems. Funded by: *ARC Discovery Projects 2018 from (2018 to 2020)*

Regulation of the Cell Bus Voltages of Large Scale Modular Multilevel Converters: Advanced Energy Converters for Future Electricity Grids. Funded by: *ARC Discovery Grant 2014 from (2014 to 2017)*

Practice-based Systematized Nomenclature (SNOMED) concept learning for drug-disease precaution early detection and refinement. Funded by: *ARC Linkage Project Grant 2010 Round 2 from (2011 to 2015)*

Supervisor Projects

Note: Supervision projects since 2004

5 PhD Current Supervisions
9 PhD Completions

Supervisor Interests

Electrical energy conversion, Smart energy, Renewable energy, Power electronics, Electrical power generation, Transmission and distribution