

## CURRICULUM VITAE

Greg Hunter

### QUALIFICATIONS

Bachelor of Engineering, Honours, Second Class, First Division, University of Sydney, 1975.

Master of Engineering by Research, N.S.W. Institute of Technology ( now University of Technology, Sydney), 1984.

Doctor of Philosophy , University of Technology, Sydney, 1998.

### KEY AREAS OF EXPERTISE

Power Electronics

Electric Motor Controllers

Analogue Electronics

Digital Electronics

Control Systems

Embedded Micro Controllers, Software and Hardware

### EMPLOYMENT HISTORY

2013 to present;

Adjunct Fellow (honorary), University of Technology, Sydney

Continuing research into control of permanent magnet and stepper motors without rotor position sensors.

2002 to 2013;

Senior Research Fellow, University of Technology, Sydney

Main projects include:

Research into control of permanent magnet motors without rotor position sensors.

Design of a remote control unit for plantation shutters (Australian Timber Shutters Pty Ltd business grant)

Design of head move controllers for electric wheelchairs using RF links.

Design of a motor controller for a solar powered water pump.

Design of a electronic controller for a 250kW wind turbine.

Design and development of a transcutaneous energy transfer system to power the Ventracor artificial heart assist device.

Design of implantable ultrasonic measuring device for cardiac monitoring at the Royal North Shore Hospital.

2001 to 2002:

Senior Design Engineer, Cogenic Pty Ltd (Previously PowerlineGES Pty Ltd)

Design of a 5kW, natural gas powered engine-generator-rectifier-inverter set to supply power to the grid.

1997 to 2001:

Senior Research Fellow, University of Technology, Sydney

Design of low cost induction motor speed controllers for use in fans in air conditioning units plus various contract consulting work.

1995 to 1997:

Consultant to Insearch and the University of Technology, Sydney, and others.

1992- 1995:

Ph.D. research student,  
University of Technology, Sydney

Research area: Thyristor motor drives.

1987-1992:

Design Engineer,  
Maitec Pty. Ltd.

Design of uninterruptible power supplies.

1981-1987:

Engineer, University of Technology, Sydney

Power Electronics research and design plus various consulting work for Insearch Ltd.

1979-1981:

Design Engineer, AWA Ltd

Design of switched mode power supplies.

1975-1978:

Engineer, University of Technology, Sydney

Power Electronics research and design.

## PATENTS

- (1) USA Patent No. 9,007,004 B2 "Sensorless AC Motor Control." Granted Apr. 14, 2015.
- (2) USA Patent No.4,777,581 "Modulation Method and Apparatus for Static Power Frequency Changers."

## PUBLICATIONS

(Please note: I changed my surname from Smith to Hunter in 1988)

- (1) Dung H Pham, Gregory Hunter, Li Li; Jianguo Zhu, "Advanced microgrid power control through grid-connected inverters," 2015 IEEE PES Asia-Pacific Power and Energy Engineering Conference (APPEEC), Brisbane, 15-18 Nov. 2015.
- (2) Rifai Chai, Sai Ho Ling, G.P. Hunter, Y. Tran, H.T. Nguyen, "Brain-Computer Interface Classifier for Wheelchair Commands Using Neural Network With Fuzzy Particle Swarm Optimization," IEEE Journal of Biomedical and Health Informatics, Volume 18, Issue 5, 2014.

- (3) Nguyen Khanh Quang, Nguyen Trung Hieu, G.P. Hunter, Q.P. Ha, "FPGA-based sensorless PMSM drive using parallel reduced-order Extended Kalman Filter," 2012 International Conference on Control, Automation and Information Sciences (ICCAIS), Ho Chi Minh City, 26-29 Nov. 2012.
- (4) Rifai Chai, Sai Ho Ling, G.P. Hunter, H.T. Nguyen, "Mental non-motor imagery tasks classifications of brain computer interface for wheelchair commands using genetic algorithm-based neural network," The 2012 International Joint Conference on Neural Networks (IJCNN), Brisbane, 10-15 June 2012.
- (5) Rifai Chai, Sai Ho Ling, G.P. Hunter, H.T. Nguyen, "Mental task classifications using prefrontal cortex electroencephalograph signals," 2012 Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), San Diego, Aug. 28 2012-Sept. 1 2012.
- (6) Rifai Chai, Sai Ho Ling, G.P. Hunter, H.T. Nguyen, "Toward fewer EEG channels and better feature extractor of non-motor imagery mental tasks classification for a wheelchair thought controller," 2012 Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), San Diego, Aug. 28 2012-Sept. 1 2012.
- (7) S. Prasetya, Li Li, G. Hunter, Jianuo Zhu, "Prospect of renewable energy utilization in a Indonesian city through microgrid approach," 2012 22nd Australasian Universities Power Engineering Conference (AUPEC), Bali, 26-29 Sept. 2012
- (8) Nguyen Khanh Quang, Nguyen Trung Hieu, G.P. Hunter, Q.P. Ha, "FPGA-based sensorless PMSM drive using parallel reduced-order Extended Kalman Filter," 2012 International Conference on Control, Automation and Information Sciences (ICCAIS), Ho Chi Minh City, 26-29 Nov. 2012.
- (9) G. P. Hunter, "A sensorless PMSM fundamental mode controller with high dynamic full range speed control," IECON 2011 - 37th Annual Conference on IEEE Industrial Electronics Society, Melbourne, 7-10 Nov. 2011.
- (10) G. P. Hunter, "A Reliable, Low Cost IGBT Gate Drive Circuit," Australian Universities Power Engineering Conference, AUPEC2008, Sydney, 14-17 December 2008.
- (11) P. A. Watterson, G. P. Hunter, H. C. Lovatt, S. J. Collocott, J. B. Dunlop, P. B. Gwan, B. Kalan, "High Torque Brushless DC Motor for a Valve Actuator," invited paper at Eighth International Conference on Electrical Machines and Systems, September 27-29, 2005, Nanjing, China.
- (12) W.M.Holliday, C.E.Evans, V.S.Ramsden, V. Ramaswamy, G.P.Hunter, "Marine Electric Hybrid Power Systems," invited paper, Proc. Of Pacific 2002 International Maritime Conference, Sydney, 29-31 Jan 2002, pp 484-491, Inst. Of Engineers, Australia, Barton.
- (13) P.A.Watterson, W.M.Holliday, C.E.Evans, V.S.Ramsden, V. Ramaswamy, G.P.Hunter, "UTS Brushless DC Motors and Controllers for the Solar Sailor Ferry," invited paper, Proc. Of Pacific 2002 International Maritime Conference, Sydney, 29-31 Jan. 2002, pp 549-552, Inst. Of Engineers, Australia, Barton.
- (14) V.S. Ramsden, G.P. Hunter and J. Zhang, "Impact on the power system of single-phase input cycloconverter motor drives", IEE Proc.-Electr. Power Appl., Vol. 142, No. 3, May 1995, pp 176-182.
- (15) J. Zhang, G.P. Hunter and V.S. Ramsden, "Performance of a single-phase to three-phase cycloconverter drive," IEE Proc.-Electr. Power Appl., Vol. 142, No. 3, May 1995, pp 169-175.
- (16) V.S. Ramsden, G.P. Hunter and J. Zhang, "Optimum design of an induction motor for a 1-phase to 3-phase cycloconverter," Proceedings of International Conference on Electrical

Machines, Paris, 1994, pp 230-235.

- (17) G.P. Hunter, J. Zhang and V.S. Ramsden, "Design of a low cost 1 phase to 2 phase induction motor drive using a cycloconverter," Australian Universities Power Engineering Conference, AUPEC'93, Wollongong, 29 September-1 October 1993.
- (18) J. Zhang, G.P. Hunter and V.S. Ramsden, "A single phase input cycloconverter driving a three phase motor," 5th European Conference on Power Electronics, EPE'93, Brighton, UK, 14-17 September 1993.
- (19) V.S. Ramsden, G.P. Hunter and J. Zhang, "Performance and simulation of a single-phase-to-2-phase cycloconverter motor drive," IEE Proceedings-B, Vol. 140, No. 6, November 1993, pp 341-349.
- (20) V.S. Ramsden, G.P. Hunter and J. Zhang, "The effect on the supply of a 1-phase to 2-phase cycloconverter driving an induction motor," Australian Universities Power Control Engineering Conference, AUPCEC'91, Melbourne, 3-4 October 1991.
- (21) G.P. Hunter and V.S. Ramsden, "New improved modulation method for a cycloconverter driving an induction motor," IEE Proceedings, Vol. 135, Pt B, No. 6, November 1988, pp 324-333.
- (22) G.P. Smith, "Induction motor model for variable speed drives," Universities Symposium on Electrical Power Engineering, Sydney, 28-30 August 1985.
- (23) G.P. Smith and V.S. Ramsden, "A new improved modulation method for the non-circulating current cycloconverter when used to drive an induction motor," Universities Symposium on Electrical Power Engineering, Sydney, 28-30 August 1985.
- (24) G.P. Smith and V.S. Ramsden, "A study of new techniques for the control of cycloconverters, with reference to A.C. machine control," I.E. Aust. Electrical Engineering Transactions, Vol. EE14, No. 2, pp 92-96.

#### LIST OF CONSULTING PROJECTS COMPLETED

- 1981 Design of inductors to reduce motor acoustic noise in an inverter-fed induction motor drive. (Industry Uniserve Pty Ltd)
- 1982 Design of various modifications and additions to existing switched mode power supplies. (Electrical Equipment Ltd. (Now AWA Ltd)
- 1983 Design of a switched mode power supply to power a medical e.c.g. monitoring instrument. (Ausonics Pty Ltd)
- 1983 Consultations on the design of switched mode power supplies. (Statronics Power Supplies)
- 1983 Conversion of a 3 phase input, 3.7kW inverter drive to 415V, single phase input, for use in locations supplied by a single wire, earth return system. (Industry Uniserve Pty Ltd)
- 1984 Evaluation of tenders for the supply of A.C. variable speed induction motor drives for a hot strip mill run-out table. Carried out in collaboration with V.S. Ramsden and H.T. Nguyen. (Australian Iron & Steel Pty Ltd)
- 1985 Full testing of a new 22kVA A.C. inverter for controlling the speed of an induction motor. (Industry Uniserve Pty Ltd)
- 1990 Design of the switched mode power supply for the Amlab data logging and processing equipment. (Associative Measurements Pty Ltd)

- 1993 Design of a miniature inverter drive for a permanent magnet motor in the wheel of a golf buggy. (GPW Pty Ltd)
- 1994 Design of a 300W switched mode power supply. (Associative Measurements Pty Ltd)
- 1994 Design of the hardware including the microcomputer, gate array and high frequency mains coupled transmitter and receiver for a long distance power line carrier system. (South East Queensland Electricity Board)
- 1995 Consulting to a major appliance manufacturer in the design of a future product.
- 1995 Design of a high isolation switched mode power supply for medical applications. (Associative Measurements Pty Ltd)
- 1995 Design of a 1.5 kW PWM inverter drive for a permanent magnet motor. (with CSIRO-UTS research consortium as part of GIRD grant 15057)
- 1996 Design modifications to an 8 kW inverter for welding applications. (Hydrogen Technology Limited)
- 1997 Design of a controller for a chiller plant. This used a Hitachi SH7032 microcontroller. (Turbocor Ltd, Montreal, Canada)
- 1997 Design and oversee construction of a 1500kVA cycloconverter inching drive for the ball and SAG mills at a Canadian copper mine (Synergy Engineering Ltd, Vancouver, Canada).
- 1998 Design of a 400W, multiple output, universal input, power factor corrected switched mode power supply (Fairlight ESP Pty Ltd).
- 2000 Design of a motor speed controller for a 70kW high speed permanent magnet motor compressor drive for use in a chiller plant (Turbocor Ltd, Montreal, Canada).
- 2013 Mechanical and Electrical design of a remote control for plantation shutters (Australian Timber Shutters Pty Ltd).