

Dr. Norbert Chow CHEUNG 張宙博士 (updated May 2024)

BSc(Eng), MSc(Eng), PhD, CEng, Sen. MIEEE



I PERSONAL DETAILS

Email: norbert.cheung@polyu.edu.hk norbertcheung@szu.edu.cn

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Date of Birth: 13 January 1959

Country of Birth: Beijing, China

Citizenship: Australian

Languages: Chinese, English

II CAREER HISTORY

Date	Job Title	Dept./Employer	Nature of work
Aug81- Feb83	Electronics Engineer	Advance Manufacture Engineering Dept., General Electric (HK)	Design and development of microprocessor-based automation equipment and instruments
Feb83- Sep85	Assistant Consultant	Electronics Services Division, Hong Kong Productivity Council	Development of computerized industrial controllers and automated production methods for HK industry. Setting up and conducting seminars.
Sep85 - Feb92	Senior Lecturer	Department of Electrical Engineering, Hong Kong Polytechnic	Teaching, research, course administration, project supervision.
Mar92- Jul95	Full time PhD Student	School of Electrical Engineering, University of New South Wales	Undertake a research project on: "Intelligent control of a nonlinear industrial solenoid actuator".
Sep95- Mar96	Senior Electronic Engineer	Engineering Development Dept, Philips Mobile Phones.	Look after the EMI/EMC testing, type approval matters, telecom regulations, safety and electrical aspects of Philips telecommunication products
Mar96- Aug97	Technical Manager	R & D (Motion) Department, ASM Assembly Automation.	To provide technical expertise and conduct research work in power electronics, control, & motion systems
Sep97- Jan 2019	Lecturer/ Assistant Professor/ Associate Professor	Department of Electrical Engineering, Hong Kong Polytechnic University.	Teaching, Research, Professional Activities, Administration
Jan2019- NOW	Part Time Associate Professor	Dept of Electrical & Electronic Engineering, PolyU	Teaching and other academic activities
Feb2021 - Jun 2024	Associate Professor	College of Mechatronics and Control Engineering, Shenzhen University	Teaching and other a cademic activities

III EXPERIENCE HIGHLIGHTS IN FIGURES

1. More than 40 years of academic/industrial experience in Engineering/Computing, specializing in Robotics, Motion Control, Electric Machines, Power Electronics, Industrial Automation, and Actuators Design.
2. More than 30 years of university teaching experience at the Hong Kong Polytechnic and the Hong Kong Polytechnic University.
3. Academic management experience as: Higher Diploma, Master of Science, and Engineering Doctorate Programme Leaders; Publicity and Marketing Chair, Departmental Management Committee, Departmental Web Master, Learning & Teaching Committee, and Departmental Research Committee. Active involvement in Curriculum Revision, Programme Validations and Accreditation Exercises.
4. Voted as “the best teacher of EE Department” in 2017, with one of the best teaching feedback scores in the department throughout the recent years.
5. Active involvement in Technical Societies, as the: IEEE (HK) Chapter Chair, IEEE Power Chapter Chair, IEEE Conference Chair, Journal editorial boards. Active connection with local industries, large establishments, government organizations.
6. Active in Local Professional Services, including EMSD Tribunal Board, VTC Training Board, IC Steering Committee, Development Bureau Tribunal Panel, Immigration Department, etc.
7. A wide spectrum of subject contents taught: ranging from fundamental subjects in electronics, circuits, computers, software, machines, power, control, to specialized subjects in aerospace components, project management, electric vehicle, green energy, industrial automation and robotics.
8. 5 times GRF (ERG) Projects proposal success since 2000.
9. 70 journal papers (mostly class A); 125 conference papers, and 5 patents.
10. 6 best paper awards, and 6 internal awards, including the President’s Award, for research and professional activities.

IV ACADEMIC ACHIEVEMENTS & TECHNICAL INSTITUTIONS MEMBERSHIPS

Date	Name of Institution	Degree	Date of award
Oct78-Jul81	Queen Mary College, University of London, UK	BSc.(Eng) in Electrical and Electronics Engineering (2 nd class upper)	Aug 81
Oct84-Jul87	University of Hong Kong, Hong Kong	MSc.(Eng) in Electrical Engineering	Nov 87
Mar92-Jul95	University of New South Wales, Australia	PhD in Electrical Engineering. (Title: A nonlinear short stroke proportional solenoid)	Sep 96

Institution	Class of Membership	Title	election detail	Date
The Engineering Council, UK	Chartered Engineer	CEng	by registration	19th February 1988.
The Institution of Electronics and Radio Engineers (IERE), UK. Founding organization of IET	Corporate Member	MIET	by election	9th September, 1987.
The Institute of Electrical and Electronics Engineers, (IEEE), USA,	Senior Corporate Member	Senior MIEEE	by election	1st February 2005.

V TEACHING

(i) Teaching Statement

For an academic profession, the most rewarding thing is to see the students making the best use of their ability to learn, and thriving when they enter into their profession. To this end, I firmly believe that teaching should be:

- Lectures should be interesting and related to applications, so that the student knows the importance of the subject matter.
- Mathematics, logic manipulation, etc. should be used as a tool to make the student to have a deeper understanding on the related topic. We should not teach all these items, just for the sake of teaching the manipulation skills only.
- We should constantly view the lecture delivery from the student's point of view, and should understand their way of thinking and their difficulties.

(ii) Supervision of Postgraduate Students (by Research)

- Sun Zhengang (PhD) – Nov 2010
- Chow Hoi Wai (PhD) – Nov 2012
- Zhu Zhang (PhD) - Nov 2012
- Zhao Shiwei (PhD) Nov 2009
- Pan Jianfei (PhD) – Nov 2007
- Kenneth KC Chan (PhD) - Nov 2005
- Kenneth Tsui (MPhil) – Nov 2008
- S.C. Kwok (MPhil) – Nov 2008
- Michael SW Tan (MPhil) Nov 2005

(iii) Teaching Subjects

1. Intelligent Motion Systems, *MSc*
2. Aircraft Power Electronics and Actuation Systems, *MSc*
3. Real Time Computing, *MSc*
4. Industrial Computer Applications, *BEng*
5. Computer Systems Engineering, *BEng*
6. Circuits and linear Systems, *BEng*
7. Electrical Energy Saving Systems, *MSc*
8. Electric Vehicle, *MSc*
9. Analogue and Digital Electronics *HD, BEng*
10. Power Electronics and Drives, *HD, BEng*
11. Engineering Project Management, *BEng*
12. Basic Electricity and Electronics, *HD, BEng*
13. Hybrid and Electric Car Technology, *MSc*
14. Linear Systems and Circuits, *BEng*
15. Digital Control Systems, *BEng*
16. Control Systems and Signal Processing, *BEng*
17. Electrical Technology, *HD, BEng*
18. Engineers in Society, *BEng*
19. Instrumentation, *BEng*
20. Research Methodology and Presentation Method, *MSc*.
21. Automatic Control Theory *BEng*
22. Signals and Systems, *BEng*
23. Circuit Analysis *BEng*.

(iv) Features

1. SFQ: report on the student questionnaires on individual subjects are available. Typically, the SFQ reflected an overall **score of 4.0** for most of the subjects (i.e. top 25% of teaching satisfaction)
2. Recipient of the “**Best Teacher Award**” in 2017.

VI RESEARCH (updated till 2019)

(i) Journal Papers

---2024 ---

[J78] K Chen, Z Nie, C Yan, NC Cheung, EKW Cheng, J Pan " A Non-Communication Mutual Inductance Estimation Method for Multiple Transmitters SS-compensated Dynamic Wireless Power Transfer with Low Calculation Effort" IEEE Transactions on Power Electronics 2024

[J77] X Yang, Y Ouyang, K Chen, N Cheung, J Pan "A Small-size Foreign Metal Objects Detection Based on Rectangular-coil Array for DWPT Systems" IEEE Transactions on Instrumentation and Measurement 2024

[J76] Z Zhang, X Yang, W Wang, K Chen, NC Cheung, J Pan, "Enhanced Sliding Mode Control for PMSM Speed Drive Systems Using a Novel Adaptive Sliding Mode Reaching Law Based on Exponential Function" IEEE Transactions on Industrial Electronics 2024

---2023 ---

[J74] K Chen, Y uyang, X Yang, NC Cheung, EKW Cheng, J Pan, "A High-Interoperability Optimal Frequency Control Method for the AGV Dynamic Wireless Charging Systems without Communication", IEEE Transactions on Power Electronics

--- 2022---

[J73] XS Jiang, Y Hong, K Chen, N Cheung, KWE Cheng, JF Pan, "A communication-free droop control scheme for distributed linear switched reluctance wave power generation system with adaptive voltage compensation", International Journal of Electrical Power & Energy Systems, Elsevier, Vol 143, Dec 2022. <[paper](#)>

[J72] L Li, Norbert Cheung, Guilin Yang, Chongchong Wang, PF Fu, GC Li, JF Pan , "Design of a variable-gain adjacent cross-coupled controller for coordinated motion of multiple permanent magnet linear synchronous motors ", Computers and Electronics in Agriculture, Elsevier, Vol 192, page 106561, Jan 2022. <[paper](#)>

--- 2019---

[J71] JF Pan, Qianlong Li, Xiaoyu Wu, Norbert Cheung, Li Qiu, "Complementary power generation of double linear switched reluctance generators for wave power exploitation", International Journal of Electrical Power & Energy Systems, pp33-44 Vol 106, 2019. <[paper](#)>

[J75] Y Zhou, KWE Cheng, NC Cheung, "Investigation on Advanced Control of A Linear Switched Reluctance Motor" Asian Power Electronics Journal, Vol. 13 , No. 1, June 2019 <[paper](#)>

--- 2018---

[J65] S Li, KWE Cheng, NC Cheung, Y Zou, "Design and Control of a Decoupled Rotary-Linear Switched Reluctance Motor", IEEE Transactions on Energy Conversion, Mar, 2018. <[download](#)>

[J64] JF Pan, W Wang, E Cheung, NC Cheung, X Wu, B Zhang, "Self-Tuning Position Control for the Linear Long-Stroke, Compound Switched Reluctance Conveyance Machine", International Journal of Precision Engineering and Manufacturing 19 (3), 387-394, 2018. <[download](#)>

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[J70] JF Pan, Qianlong Li, Li Qiu, Norbert Cheung, Xiaoyu Wu, Bo Zhang, "A fuzzy position controller for linear switched reluctance motor", International Journal of Applied Electromagnetics and Mechanics, pp 613-624, Vol 55, Iss. 4, 2017. <[download](#)>

[J63] Y Zou, KWE Cheng, NC Cheung, JF Pan, " A Polymer-Based Air Gap Length Prediction Method with Current Injection and Fuzzy Logic Observer", IEEE Transactions on Magnetics 53 (11), 1-4, 2017. <[download](#)>

[J62] JF Pan, W Wang, B Zhang, NC Cheung, L Qiu, "Self-tuning Position Control for the Linear Long-stroke, Compound Switched Reluctance Conveyance Machine", International Journal of Power Electronics and Drive Systems 8 (3), 1435, 2017. <[download](#)>

--- 2016---

[J61] B Zhang, J Yuan, L Qiu, NC Cheung, JF Pan, "Distributed coordinated motion tracking of the linear switched reluctance machine-based group control system", IEEE Transactions on Industrial Electronics 63 (3), 1480-1489, 2016. [<download>](#)

[J60] SD Huang, GZ Cao, ZY He, C Wu, JA Duan, NC Cheung, QQ Qian, "Maximum-force-per-ampere strategy of current distribution for efficiency improvement in planar switched reluctance motors", IEEE Transactions on Industrial Electronics 63 (3), 1665-1675, 2015. [<download>](#)

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[J68] JK Lin, KWE Cheng, Z Zhang, NC Cheung, XD Xue, "Adaptive Sliding Mode Technique Based Electromagnetic Suspension System with Linear Switched Reluctance Motor", JK Lin, KWE Cheng, Z Zhang, NC Cheung, XD Xue, IET Electric Power Applications, 2015, Vol 9, Iss 1, 50-59. [<download>](#)

[J67] JF Pan, Y Zou, GZ Cao, NC Cheung, B Zhang, "High Precision Dual Loop Position Control of an Asymmetric Bilateral Linear Hybrid Switched Reluctance Motor", IEEE Trans. on Magnetics, Vol 51, No 11, Nov 2015. [<download>](#)

[J66] SY Li, KWE Cheng, NC Cheung, "A New Two-degree of Freedom Reluctance Motor for Electric Vessel", Asian Power Electronics Journal, 52-57, Vol 9, No 2, Dec 2015. [<download>](#)

[J59] J Pan, SW Or, Y Zou, NC Cheung, "Sliding-mode position control of medium-stroke voice coil motor based on system identification observer", IET Electric Power Applications 9 (9), 620-627, 2015. [<download>](#)

[J58] JF Pan, Y Zou, G Cao, NC Cheung, B Zhang, "High-precision dual-loop position control of an asymmetric bilateral linear hybrid switched reluctance motor", IEEE Transactions on Magnetics 51 (11), 1-5, 2015. [<download>](#)

[J57] Y Zou, NC Cheung, JF Pan, "An adaptive high-precision tracking controller for the coupled switched reluctance two-finger gripper", IEEE Transactions on Magnetics 51 (11), 1-4, 2015. [<download>](#)

--- 2014---

[J69] Y Zou, KWE Cheng, NC Cheung, JF Pan, "Deformation and Noise Mitigation for the Linear Switched Reluctance Motor with Skewed Teeth Structure", IEEE Trans. on Magnetics, Vol 50, No 11, Nov 2014. [<download>](#)

[J56] J.F. Pan, Y Zou, NC Cheung, GZ Cao, "The direct-drive sensorless generation system for wave energy utilization," International Journal of Electrical Power & Energy Systems, Volume 62, November 2014, Pages 29–37, 2014. [<download>](#)

[J55] JF Pan, FJ Meng, NC Cheung, "Core Loss Analysis for the Planar Switched Reluctance Motor," IEEE Trans. On Magnetics, Iss 2, Vol 50, Feb 2014. [<download>](#)

[J54] JF Pan, FJ Meng, GZ Cao, NC Cheung, "Performance Analysis and Decoupling Control of an Integrated Rotary-linear Machine with Coupled Magnetic Paths," IEEE Trans. On Magnetics, Iss 2, Vol 50, Feb 2014. [<download>](#)

[J53] JF Pan, Z You, NC Cheung, GZ Cao, "On the Voltage Ripple Reduction Control of the Linear Switched Reluctance Generator for Wave Energy Utilization," IEEE Trans. on Power Electronics, Vol 29, Iss 10, pp 5298-5307, Nov 2013. [<download>](#)

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[J52] JF Pan, NC Cheung, Y Zou, "High-precision control of LSRM based X-Y table for industrial applications, " ISA Transactions, Volume 52, Issue 1, January 2013, Pages 105–114. [<download>](#)

[J51] HW Chow, NC Cheung, "Disturbance and response time improvement of sub-micrometer precision linear motion system by using modified disturbance compensator and internal model reference control," IEEE Trans. On Industrial Electronics, Vol 60, Iss 1, pp 139-150, Jan 2013. [<download>](#)

[J50] JK Lin, KWE Cheng, Z Zhang, NC Cheung, XD Xue, TW Ng, "Active Suspension System Based on Linear Switched Reluctance Actuator and Control Schemes," IEEE Trans. on Vehicular Technology, Vol 62, No 2, Iss 99, pp 562-571, Feb 2013. [<download>](#)

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[J49] Z Zhang, NC Cheung, KWE Cheng, XD Xue, J.KLin, "Direct Instantaneous Force Control with Improved Efficiency for Four-quadrant Operation of Linear Switched Reluctance Actuator in Active Suspension System," IEEE Transactions on Vehicular

Technology, Vol 61, Iss 4, pp 1567-1576, 2012. [<download>](#)

[J48] YJ Bao, KWE Cheng, NC Cheung, SL Ho, "Experimental examination on a new switched reluctance wind power generator system for electric vehicles," IET Power Electronics, Vol 5, Iss 8, pp 1262-1269, Sep 2012. [<download>](#)

[J47] JF Pan, NC Cheung, Y Zou, "High-precision control of LSRM based X-Y table for industrial applications," ISA Transactions, Sep 2012.

[J46] XD Xue, KWE Cheng, YJ Bao, PL Leung, NC Cheung, "Switched Reluctance Generators with Hybrid Magnetic Paths for Wind Power Generation," IEEE Trans. On Magnetics, Vol 48, Iss 11, pp 3863-3866, Nov 2012. [<download>](#)

[J45] JF Pan, NC Cheung, Y Zou, "Design and Analysis of a Novel Transverse-Flux Tubular Linear Machine With Gear-Shaped Teeth Structure," IEEE Trans. On Magnetics, Vol 48, Iss 11, pp3339-3343, Nov 2012. [<download>](#)

[J44] JF Pan, NC Cheung, Y Zou, "An Improved Force Distribution Function for Linear Switched Reluctance Motor on Force Ripple Minimization With Nonlinear Inductance Modeling," IEEE Trans. On Magnetics, Vol 48, Nov 2012, Iss 11 pp 3064-3067, Nov 2012. [<download>](#)

[J43] XD Xue, KWE Cheng, Z Zhang, JK Lin, NC Cheung, "A Novel Method to Minimize Force Ripple of Multimodular Linear Switched Reluctance Actuators/Motors," IEEE Trans. On Magnetics, Vol 48, Iss 11, pp 3859 – 3862, Nov 2012. [<download>](#)

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[J42] Z Zhang, NC Cheung, KWE Cheng, XD Xue, JK Lin, "Longitudinal and Transversal End Effects Analysis of Linear Switched Reluctance Motor," IEEE Transactions on Magnetics, Vol 47, Iss10, pp 3979-3982, Oct 2011. [<download>](#)

[J41] SZ Chen, NC Cheung, Y Zhang, M Zhang and XM Tang, "Improved Grid Synchronization Control of Doubly-fed Induction Generator under Unbalanced Grid Voltage," IEEE Transactions on Energy Conversion, Vol 26, Iss 3, pp 799-810, Sep 2011. [<download>](#)

[J40] JF Pan, NC Cheung, 'An Adaptive Controller for the Novel Planar Switched Reluctance Motor,' IET Proceedings on Electric Power Applications," Vol 5, Iss 9, pp 677-683, Nov 2011. [<download>](#)

[J39] JF Pan, NC Cheung, "Multi-dimensional Switched Reluctance Motors for Industrial Applications", Industrial Robot: An International Journal, Vol 38, Iss, 4, 2011, p 419-428. [<download>](#)

[J38] SZ Chen, NC Cheung, KC Wong, J Wu, "Integral Variable Structure Direct Torque Control of Doubly fed Induction Generator," IET Proceedings on Renewable Power Energy, Vol. 5, Iss. 1, Jan 2011, p 18-25. [<download>](#)

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[J37] SW Zhao, NC Cheung, WC Gan, JM Yang, "High Precision Position Control of a Linear Switched Reluctance Motor Using a Self-Tuning Regulator, " IEEE Transactions on Power Electronics, Vol 25, Iss 11, Nov 2010, p 2820-2827. [<download>](#)

[J36] ZG Sun, NC Cheung, SW Zhao, WC Gan, "Magnetic Analysis of Switched Reluctance Actuators in Levitated Linear Transporters," IEEE Transactions on Vehicular Technology, Vol 59, No 9, Nov 2010, p 4280-4288. [<download>](#)

[J35] HW Chow, NC Cheung, W Jin, "An Analog Detection Device in a Sub-micron Linear Encoder based on a Fiber Optic Interferometer with a 3×3 Coupler," IET Science, Measurement & Technology, Vol 4, Iss 5, 2010, p 237-245. [<download>](#)

[J34] X. D. Xue, K. W. E. Cheng, J. K. Lin, Z. Zhang, K. F. Luk, T. W. Ng, and N. C. Cheung, "Optimal Control Method of Motoring Operation for Switched Reluctance Motor Drives in Electric Vehicles," IEEE Trans Vehicular Technology, Vol 59, No 3, March 2010, p 1191-1204. [<download>](#)

[J33] X. D. Xue, K. W. E. Cheng, T. W. Ng, and N. C. Cheung, "Multi-Objective Optimization Design of In-Wheel Switched Reluctance Motors in Electric Vehicles", IEEE Trans Industrial Electronics, Vol 57, No 9, Sep 2010, p 2980-2987. [<download>](#)

[J32] HW Chow, NC Cheung, W Jin, "A Low Cost Sub-Micro Linear Incremental Encoder Based on 3×3 Fiber-Optic Directional Coupler," IEEE Trans on Instrumentation and Measurement, Vol 59, No 6, June 2010, p 1624-1633. [<download>](#)

[J31] SZ Chen, NC Cheung, KC Wong, J Wu, "Integral Sliding-Mode Direct Torque Control of Doubly-Fed Induction Generators Under Unbalanced Grid Voltage," IEEE Transactions on Energy Conversion, Vol 25, No 2, June 2010, p 356-368. [<download>](#)

[J30] ZG Sun, NC Cheung, SW Zhao, WC Gan, "Application of Disturbance Observer Based Sliding Mode Control for Magnetic Levitation Systems", Proceedings of the Institution of Mechanical Engineers Part C Journal of Mechanical Engineering Science,

Vol 224, p 1635-1644, 2010. [<download>](#)

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[J29] SZ Chen, NC Cheung, KC Wong, J Wu, "Grid Synchronization of Doubly-fed Induction Generator Using Integral Variable Structure Control," IEEE Trans on Energy Conversion, Vol 24, No. 4, Dec 2009, pp875-883. [<download>](#)

[J28] SW Zhao, NC Cheung, WC Gan, ZG Sun, "A Novel Flux Linkage Measurement Method for Linear Switched Reluctance Motors," IEEE Trans on Instrumentation and Measurement, vol 58, no. 10, pp 3569-3575, Oct 2009. [<download>](#)

[J27] K Tsui, NC Cheung, CWK Yuen, "Novel Modeling and Damping Technique for Hybrid Stepping Motor," IEEE Trans on Industrial Electronics, Iss. 1, Vol. 56, pp202-211, Jan 2009. [<download>](#)

[J26] SW Zhao, NC Cheung, WC Gan, JM Yang, "Position Estimation and Error Analysis in Linear Switched Reluctance Motors," IEEE Trans on Instrumentation and Measurement, Vol 58, no. 8, pp2815-2833, Aug 2009. [<download>](#)

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[J25] NC Cheung, SW Zhao, WC Gan, JM Yang, "An Effective Modeling and Control Strategy for Linear Switched Reluctance Motors," Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science, v 222, n 11, November, 2008, p 2111-2121. [<download>](#)

[J24] NC Cheung, SW Zhao, WC Gan, ZG Sun, SC Kwok, "A Novel Solar Tracking System Design based on Linear Switched Reluctance Motor," Control Theory and Applications, Vol 25, No 2, April 2008. [<download>](#)

[J23] WC Gan, GP Widdowson, SW Tam, NC Cheung, "Application of Linear Switched Reluctance Motors to Precision Position Control," Asian Power Electronics Journal, Vol 2, No 1, Apr 2008, p 31-36. [<download>](#)

[J22] SW Zhao, NC Cheung, WC Gan, JM Yang, "Passivity-Based Control of Linear Switched Reluctance Motors with Robust Consideration," IET Proceedings on Electric Power Applications, vol. 2, no. 3, May 2008, pp. 164-171. [<download>](#)

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[J21] SW Zhao, NC Cheung, WC Gan, JM Yang, JF Pan, "A Self-Tuning Regulator for the High Precision Position Control of a Linear Switched Reluctance Motor," IEEE Trans. on Industrial Electronics, Vol 54, No 5, pp 2425-2434, October 2007. [<download>](#)

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[J20] JF Pan, NC Cheung, JM Yang, "Auto-Disturbance Rejection Controller for Novel Planar Switched Reluctance Motor," IEE Proceedings, Pt-D, Electric Power Applications, Vol 153, No. 2, p 307-316, March 2006. [<download>](#)

[J19] NC Cheung, JF Pan, WC Gan, SW Zhao, "Novel Planar Switched Reluctance Motor for Industrial Applications," Power Supply Technologies and Applications, Vol 9, No 4, pp 1-4, April 2006. [<download>](#)

[J18] NC Cheung, JF Pan, WC Gan, "A Novel Planar Switched Reluctance Motor for Industrial Applications" IEEE Trans on Magnetics, Volume 42, Issue 10, pp. 2836 - 2839, Oct. 2006. [<download>](#)

[J17] J. Wang, K. M. Tsang and N. C. Cheung, "Second Order Nonlinear Trajectory Smoother for the Position Control of Linear Switched Reluctance Motor," International Journal of Modelling & Simulation, vol.26, no.2, pp.151-159, 2006. [<download>](#)

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[J16] J.F. Pan, N.C. Cheung, J.M. Yang, "High-Precision Position Control of a Novel Planar Switched Reluctance Motor," IEEE Trans on Industrial Electronics, Vol 52, No 6, pp 1644-1652, Dec 2005. [<download>](#)

[J15] K.K.C. Chan, N.C. Cheung, "Modelling and Characterisation of a Novel Two-Finger Variable Reluctance Gripper," ISA Transactions, Vol 44, Issue 2, pp 177-185, April 2005. [<download>](#)

[J14] K.K.C. Chan, N.C. Cheung, "A Novel Two-Finger Variable Reluctance Gripper for High-Speed Grasping of Delicate Objects: An Implementation Case Study," IEEE Transactions on Industrial Electronics, Vol 52, No 6, pp 1705-1707, Dec 2005. [<download>](#)

[J13] J. Wang, T. Li, K.M. Tsang, N.C. Cheung, "Differential algebraic observer-based nonlinear control of PM synchronous motor," Proceedings of the CSEE, Vol. 25, No. 2, pp.87-92, 2005. [<download>](#)

[J12] K.K.C. Chan, J.M. Yang, N.C. Cheung, "Passivity Based Control for Flux Regulation in a Variable Reluctance Finger Gripper," IEE Proceedings, Pt-D, Electric Power Applications, Vol 152, No. 3, p 686-694, May 2005. [<download>](#)

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[J11] J.M. Yang, J. Wu, N.C. Cheung, K.K.C. Chan, "Passivity based control incorporating trajectory planning for a variable-reluctance finger gripper," Proceedings Of IMechE Part I: Systems and Control Engineering, Vol. 218, p 99-109, 2004. Received the Donald Julius Groen Best paper Prize Award, 2004. [<download>](#)

[J10] N.C. Cheung, J.F.Pan, K. Chan, W.C. Gan, J.M. Yang, "Using Variable Reluctance Actuators in Automated Manufacturing Machines," Invited Paper, Power Supply Technologies and Applications, Vol. 4, Iss 7, April 2004. [<download>](#)

[J9] J. Wang, K.M. Tsang, N.C. Cheung, "Tracking Control of the LSRM based on the Second-Discrete Filter," Proc. of the CSEE, Vol. 24, No. 11, pp177-182, Nov 2004. [<download>](#)

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[J8] N.C. Cheung, J.F. Pan, "Using Variable Reluctance Actuators in Automated Manufacturing Machines," Industrial Robot, Vol. 30, No. 4, pp355-362, July 2003. [<download>](#)

[J7] W.C. Gan, N.C. Cheung, "Development and Control of a Low-cost Linear Variable reluctance Motor for Precision Manufacturing Automation," IEEE/ASME Transactions on Mechatronics, p 326 -333, Vol. 8, Issue 3, Sep 2003. [<download>](#)

[J6] W.C. Gan, N.C. Cheung, Q Li, "Position Control of Linear Switched Reluctance Motors for High Precision Applications," IEEE Transactions on Industry Applications, p 1350-1362, Vol. 39, Iss. 5, Sep/Oct 2003. [<download>](#)

[J5] Y.R. Chen, J. Wu, N.C. Cheung, "Model Reference Adaptive Control for Permanent Magnet Linear Motor Drives," Journal of SCUT (Natural Science Edition), pg 31-35, Vol 31, No. 6, June 2003. [<download>](#)

---2002 and before---

[J4] M.F. Rahman, N.C. Cheung and K.W. Lim, "Conversion of a switching solenoid to a proportional actuator," Transactions of IEE Japan, Vol I-16, Pt D, No 5, May 1996, pp531-537. [<download>](#)

[J3] M.F. Rahman, N.C. Cheung and K.W. Lim, "Position estimation in solenoid actuators," IEEE Transactions on Industry Applications, Vol 32, No.3, May/Jun 1996, pp 552-559. [<download>](#)

[J2] Y.R. Chen, J. Wu, N.C. Cheung, "Robust control techniques in permanent magnet servomotors," Micromotors Servo Techniques, Vol.33, No. 5, pp 21-24, Oct 2000. [<download>](#)

[J1] Y.R. Chen, J. Wu, N.C. Cheung, "Review on position estimation methods to permanent magnet brushless servo motors," Small and Special Electrical Machines, Vol. 28, No. 4, pp 3-7, Aug 2000. [<download>](#)

(ii) Conference Papers

125 papers in international and local conferences have been published. Please refer to www.ncheung.com for the details of each paper.

(iii) Research Index –

From Google Scholar:	h-index:	35
	i-10 index	88
	Citations:	4452

(iv) Patents (excluding Chinese Patents)

1 US Patent: NC Cheung, JF Pan, JM Yang, "Two-Dimensional Variable Reluctance Planar Motor" US Patent 7,170,203, Date granted: 30 Jan 2007.

- 2 Australian Patent: M.F. Rahman, N.C. Cheung and K.W. Lim, "Non contact position estimation," 95/533, Aug 1995.
- 3 Australian Patent: M.F. Rahman, N.C. Cheung and K.W. Lim, "Proportional solenoid drive," 95/497, Aug 1995.
- 4 X.D.Xue, K.W.E.Cheng, N.C.Cheung, "In-wheel switched reluctance motor", US patent (under filing process)
- 5 K.W.E.Cheng, Y.K.Cheng, S.K.Ki, N.C.Cheung, K.F.Kwok, "LED head-lamp and tail-lamp for automotive using classical SMPS topologies with reduced components, Mar 2008, China patent filed. 200810007700.8

(v) GRF Projects

- 1 Sensorless Control of a High-Performance Variable Reluctance Linear Motor, \$579,614, 2004-2008
- 2 A high performance 2D direct-drive planar motion system for manufacturing automation, \$499,171, 2001-2004
- 3 A Robust and Low Cost Linear Motion System for Precision Manufacturing Automation, \$405,000, 1999-2001
- 4 A Two-Dimensional Rotary-Linear Switched Reluctance Motor for the High Precision Manufacturing Industry, \$808,200, 2007-2010.
- 5 Using Magnetic-Levitated Switched-Reluctance Linear Motor for High-Precision Applications, \$691,373, 2005-2009
- 6 A New Design of Rehabilitation Robot using Functional Electrical Stimulation (FES) for People after Stroke, (as co-investigator, jointly with Department of Health Technology and Informatics) \$345,120, 2003-2006.

(vi) ITF Projects

- 1 E. Cheng, NC Cheung, E Lo, "Development of New high capacity Supercapacitor with Ultra-Low Resistance and Distributed Generator Power Balancing System." \$2 Million, 16 Dec 2014 – 15 June 2016.
- 2 E. Cheng, NC Cheung, E Lo, "High frequency distribution for vehicles", K-ZP4Q ITS/036/14, \$1.4 Million, ITF funded, 16 Oct 2014 – 15 Mar 2016.
- 3 E. Cheng, NC Cheung, "Energy-Saving Linear Refrigeration Compressors for Refrigerators and Air-Conditioners", \$0.979 Million, ITF funded. Oct 2012-Apr 2014.
- 4 E. Cheng, NC Cheung, KW Chan, E Lo, "DC Distribution for Future and Environmental City Development", 1 Oct 2013 – 31 Mar 2015, \$2 Million, ITF funded. (UIM245, ZM1G)
- 5 E. Cheng, NC Cheung, SW Or, E Lo, "Body Integrated Super-capacitor for Next Generation of Electric Vehicles," 16 Oct 2013 to 15 Oct 2014, \$1 Million, ITF funded. (ITS16813, ZP4A)
- 6 E. Cheng, NC Cheung, E Lo, "Integrated Battery Charger and Motor Drive Systems", Innovation and Technology Support Programme, HK\$ 4.1 million, Mar 2008 – Aug 2009.
- 7 E. Cheng, NC Cheung, "Low cost direct drive for electric vehicle", Innovation and Technology Support Programme, (ITF), HK \$4.1 Million, Jul 2007 – Apr 2009.
- 8 E. Cheng, NC Cheung, E Lo, WN Fu, SW Or, CK Lee, "Direct-drive Linear Switched Reluctance Actuator for Automobile Active Suspension Systems," (ITF), HK \$6 Million, Oct 2009 – Sep 2011.

(vii) Major Industrial Projects and Consultancy

- 1 Commercialization of the Variable Reluctance Linear Motor, \$0.6 Million, IGARD, 2002-4. NC Cheung.
- 2 Development of Electric Vehicle Charging Station, CLP Power Hong Kong Limited (CLP), K.W.E.Cheng, NC Cheung, W.C. Lo, C.K. Lee, Kevin Chan, \$0.6 Million, May 2009-Dec 2009.
- 3 Hopewell Wind Power Limited, "Advisory work on Design and Development of Electric Power Generator", \$90,000, Sep 2008-Jun 2009., K.W.E.Cheng, NC Cheung, W.C. Lo.
- 4 Development of the Advanced Power Electronics and Motor Drives for Automotive Systems (Niche Areas), HK\$2.1 Million Oct 06 – Mar 09. Cheng K.W.E., N.C.Cheung, Martin Chow, S.L.Ho, Edward Lo.
- 5 ATAL/PolyU contract for the HK Government – The Automatic Vehicle Clearance System (e-way for vehicles) – total \$300 Million. Joint development by IC and EE (PolyU side)

(viii) Awards

1. IEEE Industry Application Society Paper Prize Award: M.F. Rahman, N.C. Cheung and K.W. Lim, "Position estimation in solenoid actuators," IEEE Transactions on Industry Applications, Vol 32, No.3, May/June 1996, pp 552-559.
2. IEEE Industrial Electronics Society Best Presentation Award: W.C. Gan, N.C. Cheung, "A Low-Cost Linear Switched Reluctance Motor with Integrated Position Sensor for General-Purpose Three Phase Motor Controller," The 27th Annual Conference of the IEEE Industrial Electronics Society IECON'01, 29Nov-2Dec 2001, Denver, Colorado, USA.
3. Chinese Power Supplies Society Top 10 Outstanding Paper Award: S.W. Tam, N.C. Cheung, "An all-digital high-performance drive system for linear permanent-magnet synchronous motor," The 14th Chinese Power Supplies Society Annual General Meeting, 24-27 September 2001, Beijing, China.
4. The Most Valued Product Development Award in 2003: N.C. Cheung, "Development of a series of high performance linear switch reluctance motor for industry," The Hong Kong Polytechnic University, Feb 2003.
5. The Donald Julius Groen Prize 2004, from The Institution of Mechanical Engineers, Mechatronics, Informatics, and Control Group: JM Yang, KC Chan, NC Cheung, XM Jin, J Wi, "Passivity-based control for a variable-reluctance finger gripper" Proc. Of IMechE Part I: Systems and Control Engineering, Vol. 218, p 99-109, 2004.
6. The Paul Harris Fellow: NC Cheung, Rotary Club Foundation of Rotary International, Sep 2005.
7. The Most Valued Product Development Award in 2005: N.C. Cheung, M.H.L. Chow, "The Ultrasonic Beads Pattern Welding Machine," The Hong Kong Polytechnic University, April 2006.
8. Outstanding Performance/Achievement for Non-Academic Staff Team Award 2005/06, "The Automatic Vehicle Clearance System," The Hong Kong Polytechnic University, Dec 2006.
9. The President's Awards for Excellence Performance/Achievement 2005/06, "The Automatic Vehicle Clearance System," The Hong Kong Polytechnic University, Dec 2006.
10. Faculty Merit Award - "Development of Electric Vehicle," E Cheng, NC Cheung, Edward Lo, BP Divakar, X.D.Xue, K.Ding, W.W.Chan.
11. 2016 August – GOLD Medal – for the invention of "Direct Drive Linear Switched Reluctance Actuator for Automobile Active Suspension Systems" – 2016 International Invention Innovation Competition, iCAN.
12. 2015 November – Gold Prize – "Body Integration Super-capacitor for Next Generation of Electric Vehicles" – Seoul International Invention Fair SIIF.

VII MAJOR ADMINISTRATIVE DUTIES

(i) PolyU Level

1. PolyU's Non-dept Head Staff/Management Consultative Committee (4 years) – *a consultative group formed by elected member of academic departments; to discuss on important issues at the university level.*

(ii) Faculty Level

1. Engineering Faculty representative on the Industrial Centre (IC) Steering Committee (5 years) – *the Industrial Centre serves all engineering departments in the PolyU and some departments outside PolyU. This committee is responsible for all future developments of IC.*
2. Master of Science Programme Coordinator (5 years) – *since the MSc programme is hosted at the faculty level, my duty is to responsible for all matters related to the EE department MSc programme.*
3. Engineering Doctorate Programme Coordinator (3 years) - *my duty is to responsible for all matters related to the EE department Engineering Doctorate programme.*

(iii) Departmental Level

1. Departmental Management Committee Member (more than 5 years) – *to assist the Head to manage all administrative matters in the EE Department.*
2. Higher Diploma Programme Leader (13 years) – *to be responsible for all matters of the programme (including administrative, marketing, programme development, students recruitments, etc.)*
3. Academic Counselor (13 years) – *counselor for the BEng, and HD students.*
4. Active Member of Departmental Learning and Teaching, Programme Committee (undergraduate), and Staff-student Consultative Committee.
5. Member of Departmental Research Committee (4 years) – *to seek and allocate resource to promote research in the department.*
6. Laboratory Coordinator of EE Computer Centre (18 years) – *the EE Computer Centre has been a very successful endeavor. It is a student centric computing facilities provider. The place has 24-hour access and it is a very popular place for students.*
7. Publicity Committee Chair, External Liaison, and Publicity Officer (5 years) – *this is another very successful committee. Since its formation, the Electrical Engineering programmes' popularity has risen from the bottom (among all engineering disciplines) to the top of the engineering student recruitment list.*
8. Departmental Web-page Organizer (3 year) – *to revamp the EE web site so that the EE study programmes are more marketable to the secondary school students.*
9. Research Students Coordinator (2 years) – *to help and improve the study condition of research students.*

VIII PROFESSIONAL SERVICES

(i) External Appointments

Professional Board Duties

- Chair – Institution of Electrical and Electronic Engineers (IEEE), Hong Kong Section.
- Chair of Disciplinary Board Tribunal – EMSD (機電工程署), HKSAR Government.
- Board Member of E & M Services Training Board – Vocational Training Council.
- Member of Appeal Tribunal – Development Bureau (發展局), HKSAR Government.
- Associate Editor of HKIE Journal – HK Institute of Engineers (香港工程師學會).
- Technical Editor – The Chinese Power Supply Society (中國電源學會).
- Academic Consultant – Tsuen Wan Industries and Commercial Association.
- Associate Editor – China Hydro Power Engineers (“水電電氣”編輯委副主編).
- Editor – Power Conversion Technologies (“變頻技術應用”編輯委員).

Date	Position	Organisation
Apr 2011 – Mar 2013	Board Member	VTC, E&M Services Training Board
Jul 2015 – Jul 2018	Membership of Disciplinary Board Tribunal	EMSD - Electricity Ordinance (Chapter 406)
Dec 2015 – Nov 2018	Appeal Tribunal Panel	Planning and Lands Branch, Development Bureau, HK Gov
2015-2017	Associate Editor HKIE Journal	HKIE
Jan 2010 – Dec 2010	Secretary	IEEE(HK) Chapter
Jan 2011 – Dec 2011	Treasurer	IEEE(HK) Chapter
Jan 2012 – Dec 2012	Vice-Chair	IEEE(HK) Chapter
Jan 2013 – Dec 2013	Chair	IEEE(HK) Chapter
Feb 1998 - Dec 2000	Technical Programme Coordinator	IEEE (HK)
Aug 1998 - now	Exco / Treasurer / Vice-Chair / Chairman	IEEE (HK) , Joint Chapter of IES, IAS, PES, PELS

Oct 1999 – now	Technical Editor	"Power Supply Technologies and Applications"; Journal of the Chinese Power Supply Society
Oct 1999 - now	Technical Editor	"Inverter Technologies and Applications"; Journal of the Chinese Power Supply Societ
Jan 2003 - 2006	Associate Editor	"China Hydropower Electrical Technology", Institute of Chinese Hydropower Electrical Engineers
Nov 1989 - 2004	Overseas Coordinator	"The World of Power Supply" magazine
Aug 2005 - 2007	Member of Electrical and Mechanical Services Training Board	Vocational Training Council, Education and Manpower Bureau, Government of the Hong Kong Special Administrative Region
Mar 2008 - now	Academic Consultant	HK Tsuen Wan Industries & Commerce Asso.
Jun 2007 - now	Technical Committee (China)	Power Conversion & Intelligent Motion (PCIM), Germany

(ii) Major Conference Organisation (>20 times)

Date	Position	Conference
26-29 July 1999	Organizing Chairman	The 3rd IEEE Int. Conf. on Power Electronics and Drives, PEDS99
22-25 Oct 2001	Conference Advisor	The 4th IEEE Int. Conf. on Power Electronics and Drives, PEDS01
21 June 2002	Treasurer	The 5th IEEE HK Workshop on Switch Mode Power Supplies, SMPS02
10 Nov 2002	Overseas Coordinator	The 15th Conf. of China Power Supply Society, CPSSC03
17-20 Nov 2003	Conference Advisor	The 5th IEEE Int. Conf. on Power Electronics and Drives, PEDS03
18 Nov 2003	Technical Program Chair	Symposium on Hydrogen Infrastructure Technology
5-8 April 2004	Treasurer	The 2nd Int. Conf on Pwr Deregulation, Restructuring and Pwr Tech, DRPT04
9-12 Nov 2004	Treasurer	Int. Conf. on Power Electronic Systems and Applications, PESA04
12 Nov 2004	Treasurer	The 5th IEEE HK Workshop on Switch Mode Power Supplies, SMPS04
15-17 Nov 2005	Overseas Coordinator	The 16th Conf. of China Power Supply Society, CPSSC05
2-6 Oct 2005	Web Master	The IEEE Industry Applications Society 40th Annual Meeting, IAS05
14-17 Dec 2005	Track Co-Chair	The IEEE Int. Conf. on Industrial Technology, ICIT05
28-1 Dec2005	Conference Advisor	The 6th IEEE Int. Conf. on Power Electronics and Drives, PEDS05
13-14 June 2005	Treasurer	International Conference on Alternative Energy
30-2 Nov 2006	Web Master	The 7th IEE Int Conf on Pwr System Control, Operation & Mgt., APSCOM06
12-14 Nov 2006	Secretary	2nd International Conference on Power Electronics Systems and Applications
23-25 May 2007	Track Chair & Invited Talk	The 2nd IEEE Int. Conf on Industrial Electronics & Applications, ICIEA07
8-11 Oct 2007	International Steering Committee	International Conference on Electrical Machines and Systems ICEMS2007, Seoul, Korea
20-22 May 2009	Industrial Liaison	3rd International Conference on Power Electronics Systems and Applications
8-11 Nov 2009	Web Master	The 8th IEE Int Conf on Pwr System Control, Operation & Mgt., APSCOM09

(iii) Media Reports and Radio Talks

1. 東方日報, 4/8/2004: 年底快閃關, 智能卡加指模10 秒出境
2. 蘋果日報, 4/8/2004: 核對指模, 10 秒自動關
3. 蘋果日報, 25/2/2005: 理大專利研發可變磁阻平面馬達
4. 蘋果日報, 7/10/2005: 電機工程專才, 全球求才渴
5. 戰國策期刊 7/2003: 張宙創製低成本磁力致動器
6. 新城財經台 **Metro Radio FM104** - Best with the best, 才俊群英會之《人生八陣圖》, December 2006, 專訪張宙博士.
7. **RTHK Radio 3**, Backchat, “Electric Cars in Hong Kong”, interview with NC Cheung, 4 March 2009.
8. **RTHK Radio 3**, Backchat, “Clean Air and the use of Electric Vehicles”, interview with NC Cheung, 14 May 2009.
9. Comment in numerous electrical incidents in 東方日報 and 明報.

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