

RESUME

賴炎生 *FELLOW, IEEE*



臺北科技大學 終身特聘/講座教授

臺北科技大學電力電子技術中心 *Founder*

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學歷

- 英國英格蘭 BRISTOL 大學 電機電子工程系 博士
- 國立臺灣工業技術學院 電子工程組 碩士
- 國立臺北工專 電機工程科五年制畢業 (高普考及格)

經歷

- 群光電能(股票代號 6412)獨立董事 (2025-2027)
- 固緯電子(股票代號 2423) 獨立董事 (2024-2027)
- 亞力電機(股票代號 1514)獨立董事 (2024-2026)
- 國立臺北科技大學講座教授 (2013-2028)
- 中華民國電力電子協會理事長 (2016-2019)
- 科技部電力學門召集人 (Jan. 2016- Dec. 2018)
- 國立臺北科技大學終身特聘教授 (2016-)
- 國立臺北科技大學電機系 特聘教授 (2006-2016)
- 國立臺北科技大學電機系系主任
- 國立臺北科技大學電機系教授、副教授及講師

- 警察(中央警官)大學交通系 兼任教授、副教授及講師
- 美國 Virginia Tech. and State University 訪問教授
- 考試院 高等考試 典試委員、口試委員及命題委員
- 考試院 警察人員升等考試 典試委員
- 考試院 交通事業郵政人員升資等考試 典試委員
- 科技部 民生系統節能技術研發計畫諮詢委員
- 科技部 電力學門 複審委員
- 科技部 自動化學門 複審委員
- 科技部 電力學門 傑出研究獎評審
- 科技部 晶片中心 評審委員
- 教育部 玉山計畫審查委員
- 教育部 技專校院教學創新先導計畫審查委員
- 教育部 技專校院教學創新先導計畫審查委員
- 教育部 學術審議會升等審查
- 教育部 國立編譯館教科書審查
- 教育部 大專校院及高級中等學校校園節約能源管理輔導委員
- 經濟部 證券櫃檯買賣中心 上櫃審查委員
- 經濟部 中小企業處 SBIR 計畫審查委員
- 經濟部 經濟部工業局 產業升級創新平台輔導計畫專審委員
- 經濟部 經濟部技術處 A+企業創新研發淬鍊計畫科與專計畫專審委員
- 經濟部 經濟部推動中堅企業躍升計畫專審委員
- 經濟部 台灣製產品 MIT 微笑標章 家電產業類 審查委員
- 經濟部 標準檢驗局 國家標準委員會委員
- 經濟部 能源局 能源白皮書撰寫委員
- 臺北市政府環境保護局 社區節能輔導委員

- 臺北市政府 金省能獎評審委員
- 臺北市政府 觀光旅館 節能減碳績效評比評審委員
- 財團法人國立臺北科技大學文教基金會董事
- 財團法人國立臺北科技大學電機系教育基金會董事
- 東元電機研發創新委員會 外部委員 (2022-2023)
- 東元電機專利評審會 評審委員
- 東元集團 綜研所 KPI 評審會議 外部委員
- 工業技術研究院機械所技術顧問委員會機械與系統領域委員
- 工業技術研究院綠能所技術顧問委員會 委員
- 中華民國電力電子協會理事、副理事長
- 電力電子協會電力電子雙月刊總編輯
- 電機月刊變頻器專輯主編
- 奈美電子 技術諮詢顧問
- 福峰工業 技術諮詢顧問
- 東元電機 技術諮詢顧問
- 立錡電子技術諮詢顧問
- 士林電機 技術諮詢顧問
- 光寶電子 技術諮詢顧問
- 永大機電 技術諮詢顧問
- 新普科技 技術諮詢顧問
- 致茂電子技術諮詢顧問
- 亞太燃料電池 技術諮詢顧問
- 向一電子 技術諮詢顧問
- 工研院 技術諮詢顧問及特約研究
- 美國、日本、義大利、丹麥、南非及印度等大學 博士論文及教師升等 審查

- 台北綠化志工隊 志工
- 台北科技大學菁英會會員

學術服務

- **Editor**, *IEEE Journal of Emerging and Selected Topics in Power Electronics (IEEE JESTPE)*, Since 2019-2024
- 教育部學術獎「工程及應用科學」學術獎審查, 2023
- **Co-Editor-in-Chief**, *IEEE Trans. on Industrial Electronics*, 2020-2023
- **Committee Member**, *IEEE Nikola Tesla Award Committee*, 2020-2022
- International Steering Committee, IEEE IFEEC, Sydney, 2023
- Member, IES Publications Committee, Distinguished Lecturer Program Committee, 2022-2023
- Member, IES Chapter & Joint Chapter Program Committee, 2022
- **General Co-Chairs**, *IEEE IFEEC, Singapore*, 2019
- **International Steering Committee**, *ECCE Asia, Korea*, 2019
- **IEEE PEAC Technical Program Co-Chairs**, *China*, 2018
- **ACEPT International Steering Committee**, *Singapore*, 2018
- **Vice-Co Chairs, Steering Committee**, *IPEC-Niigata/ECCE-Asia, Japan*, 2018
- **Member**, *IPEC-Niigata/ECCE-Asia Takahashi Award Committee*, 2018
- **General Co-Chair**, *IFEEC - IEEE ECCE Asia*, 2017
- President, Taiwan Power Electronics Association (Dec. 2016-2019)
- **AdCom member at Large (elected)**, *IEEE Industrial Electronics Society* (2017-2019)
- **Technical Program Co-Chair**, *IEEE ICIT 2016*
- **Associate Editor**, *Electrical Power Engineering, IET, UK*, 2016
- **Track co-Chairs**, *IEEE International Conference on Electrical Machines (ICEM) 2016*
- **Track co-Chairs**, *IEEE IECON2016*
- **International Steering Committee Member**, *IEEE International conference on Power Electronics, Drives and Energy Systems (PEDES)*, 2016

- **International Steering Committee Member**, *The 3rd Symposium on Predictive Control of Electrical Drives and Power Electronics, Chile, 2015*
- **General Co-Chairs**, *IEEE IFEEEC 2015*
- **Panelist**, *IEEE ad hoc Admission & Advancement (A&A) Review Panels, April, 2015*
- **Council Member**, *IEEE Industry Application Society 2015*
- **TC Committee Chair -Industrial Drives**, *IEEE ECCE Steering Committee, 2015*
- **IEEE IAS Gerald Kliman Innovator Award Review Committee Member**, *2015*
- **Track Co-Chair**, *Electric Drives, IEEE-IFEEEC, IEEE- IEMDC 2015*
- **AdCom member at Large(elected)**, *IEEE Industrial Electronics Society (2014— 2016)*
- **Chair**, *Industrial Drives Committee, IAS, IEEE (2014-2015)*
- **IEEE IAS Gerald Kliman Innovator Award Review Committee Member**, *2014*
- **IET-EPA Paper Award and Prizes Committee Member**, *2014*
- **Technical Program Co-Chair**, *IEEE ISIE 2014*
- **Vice President**, *Taiwan Power Electronics Association (2013-2016)*
- **AdCom member at Large(elected)**, *IEEE Industrial Electronics Society (2011-2013)*
- **Chair, Technical Committee for Paper Review**, *IEEE Trans. on Industry Applications (2012-2013)*
- **Associated Editor**, *IEEE Trans. on Industrial Electronics (Since 2004)*
- **Associated Editor**, *IEEE Trans. on Industry Applications (2008-2011)*
- **Associate Editor**, *Asia Journal Control (2011-2013)*
- **Associate Editor**, *IEEE Trans. on Industry Applications, Joint Special Issue on Drives and Machines in Emerging Applications, 2012*
- **Associate Editor**, *IEEE Trans. on Power Electronics, Joint Special Issue on Power Electronics in Emerging Applications, 2012*
- **Vice Chair**, *Paper, Industrial Drives Committee, IAS, IEEE (2012-2013)*
- **Vice Chair**, *Conference, Industrial Drives Committee, IAS, IEEE (2010-2011)*
- **Secretary**, *Industrial Drives Committee, IAS, IEEE (2008-2010)*
- **Editorial Board Member**, *Electrical Power Applications, IET, UK, since 2009*

- **Editor Board Member**, *Intl. J. of Power Electronics* (since 2008)
- **Vice Chair**, Technical Program Committee, IEEE Energy Conversion Congress and Exposition (ECCE), Phoenix, 2011
- **Vice Chair**, Technical Program Committee, IEEE Energy Conversion Congress and Exposition (ECCE), Atlanta, 2010
- **Vice Chair**, Technical Program Committee, IEEE Energy Conversion Congress and Exposition (ECCE), San Jose, 2009
- **Chapter Chair**, *IEEE IAS*, Taipei Chapter (2009-2010)
- **General Co-Chair**, the International Mini-Workshop on Power Electronics and Motion Control, 2006-

考試

- 考試院 電機工程高等考試及格
- 考試院 電機技師考試及格
- 考試院 電子工程普考及格
- 教育部 公費留學考試及格

學術獎項與榮譽

- 電力電子協會『傑出貢獻獎』，2021
- 教育部第二屆國家產學大師獎，2020
- 科技部電力學門卓越貢獻獎，2020
- 東元科技文教基金會東元獎，2019
- The 2018 Prize Paper Award, IEEE Journal of Emerging and Selected Topics in Power Electronics, 2019
- 科技部一零六年度傑出研究獎學術類，2018
- 台灣電力與能源工程協會學界傑出貢獻獎，2018.
- 電力電子協會電力電子研討會最佳論文獎，Sep. 2018

- 國立臺北科技大學建校 105 週年卓越校友，Nov. 2016
- 電力電子協會電力電子研討會最佳論文獎，Sep. 2016
- 電力工程研討會優秀論文獎，Nov. 2016
- *FELLOW, IEEE*, Jan. 2014
- 電力電子協會電力電子研討會最佳論文獎，Sep. 2014
- 電力工程研討會優秀論文獎，Nov. 2013
- 國立臺北科技大學傑出校友，Oct.，2013
- 國科會二零一年度傑出研究獎學術類，2013
- Best Paper Award, IEEE Power Electronics and Drive Systems, Japan, April, 2013
- Outstanding Paper Award, Intl. Conf. on Renewable Energy Research and Applications, Japan Nov. 2012
- 電力電子協會電力電子研討會最佳論文獎，Sep. 2012
- 電力工程研討會優秀論文獎，Nov. 2011
- 電力電子協會電力電子研討會最佳論文獎，Sep. 2010
- 電力電子協會電力電子研討會最佳論文獎，Sep. 2009
- 電力電子協會電力電子研討會傑出指導教授獎，Sep. 2008
- 國科會 96 年技術移轉獎勵，Dec., 2007
- 本校電資學院傑出研究獎，2007
- 指導學生獲得國科會九十三年度研究創作獎，August, 2005
- 指導學生獲得國科會九十二年碩士論文獎，Dec. 2004
- The Best Presentation Award, *IEEE IECON*, Nov. 2004
- 教育部-東元電機產學合作績優計畫獎，Oct. 2004
- *Prize Paper Award, IEEE IAS Industrial Drives Committee*, 2003
- The Best Journal Paper Award, *John Hopkinson Premium, IEE*, UK, 1998

Selected Journal Papers:

1. Z. H. Qiu and Y. S. Lai, "Rapid Prototyping of Digital Twins Control System for IPM Drives Considering Both Saturation and Spatial Harmonics to Achieve Fast Development and Accurate Emulation," accepted by IEEE Trans. On Industrial Electronics, 2025.
2. Y. S. Lai, X. Y. Wu and Y. Y. Huang, "New Seamless Switching Control Technique between CCM and DCM for Boost PFC without Additional Zero Crossing Point Sensing Circuit," IEEE Trans. On Industrial Electronics, Vol. 70, No. 1, pp. 12100 -12110, Oct. 2024.
3. Z. H. Qiu and Y. S. Lai, "New On-Line MTPA Angle Search and Control Methods Based on Digital Twins for IPM Synchronous Motor Drives Considering Motor Non-Linearity," IEEE Access, Vol. 11, pp. 146185 – 146193, Dec. 8, 2023.
4. Y. Y. Huang and Y. S. Lai, "Optimal Inductor Design Method for GaN-Based PFC," IEEE Access, Vol. 11, 2023.
5. C. K. Lin, C. A. Agustin, J. T. Yu, Y. S. Cheng, F. M. Chen, Y. S. Lai, "A Modulated Model-Free Predictive Current Control for Four-Switch Three-Phase Inverter-Fed SynRM Drive Systems," IEEE Access, Dec. 6, 2021.
6. C. A. Agustin, J. T. Yu, Y. S. Cheng, C. K. Lin, H. Q. Huang, and Y. S. Lai, "Model-Free Predictive Current Control for SynRM Drives Based on Optimized Modulation of Triple-Voltage-Vector," IEEE Access, September 16, 2021.
7. W. S. Chen and Y. S. Lai, "Module-Based Laboratory Course for the Industry Sponsored Research and Design Master Program," IEEE Access, July 12, 2021.
8. C. A. Agustin, J. T. Yu, C. K. Lin, J. Jai and Y. S. Lai, "Triple-Voltage-Vector Model-Free Predictive Current Control for Four-Switch Three-Phase Inverter-Fed SPMSM Based on Discrete-Space-Vector Modulation," IEEE Access, April, 2021.
9. Y. S. Lai and M. H. Yu, "On-line Auto-tuning Technique of Switching Frequency for Resonant Converter Considering Resonant Components Tolerance and Variation," IEEE Journal of Emerging and Selected Topics in Power Electronics, Vol. 6, No. 4, pp. 2315 – 2324, 2018.
10. C. K. Lin, J. T. Yu, H. Q. Huang, J. T. Wang, H. C. Yu, and Y. S. Lai, "A Dual-Voltage-Vector Model-Free Predictive Current Controller for Synchronous Reluctance Motor Drive Systems," Energies, Vol. 11, No. 7, July 2018.
11. C. J. Hsu and Y. S. Lai, "Novel On-Line Optimal Bandwidth Search and Auto Tuning Techniques for Servo Motor Drives," IEEE Trans. on Industry Applications, Vol. 53, No. 4, pp.3635-3642, 2017.
12. Y. S. Lai, C. K. Lin, F. P. Chuang, and J. T. Yu, "Model-Free Predictive Current Control for Three-Phase AC/DC Converters," IET Electrical Power Application, Vol. 11, No. 5, pp. 729–739, 2017.
13. C. K. Lin, J. T. Yu, Y. S. Lai, H. C. Yu, and C. I. Peng, "Two-vector-based Modeless Predictive Current Control for Four-switch Inverter-fed Synchronous Reluctance Motors Emulating the Six-switch Inverter Operation," IET Electronics Letters, Vol. 52, No.14, pp.1244-1246, 2016.
14. C. K. Lin, J. T. Yu, Y. S. Lai, and H. C. Yu, "Improved Model-Free Predictive Current Control for Synchronous Reluctance Motor Drives," IEEE Trans. on Industrial Electronics, Vol. 63, No. 6, pp. 3942 – 3953, 2016.
15. C. K. Lin, J. T. Yu, Y. S. Lai, H. C. Yu, Y. H. Lin and F. M. Chen, "Simplified Model-Free Predictive Current Control for Interior Permanent Magnet Synchronous Motors" IET Electronics Letters, Vol. 52, No. 1, pp. 49 - 50, 2016.
16. Y. S. Lai and Z. J. Su, "New Integrated Control Technique for Two-Stage Server Power to Improve

- Efficiency under Light Load Condition," IEEE Trans. on Industrial Electronics, Vol. 62, No. 11, pp. 6944 - 6954, 2015.
17. Y. S. Lai, Z. J. Su and Y. T. Chang, "Novel Phase-Shift Control Technique for Full-Bridge Converter to Reduce Thermal Imbalance under Light-Load Condition," IEEE Trans. on Industry Applications, Vol. 51, No. 2, pp. 1651-1659, 2015.
 18. Y. S. Lai and K. M. Ho, "Novel On-Line Parameter Tuning Method for Digital Boost PFC with Transition Current Mode," IEEE Trans. on Industry Applications, Vol. 40., No. 4, pp. 2719-2727, 2014.
 19. Y. S. Lai, J. S. Su and W. S. Chen, "New Hybrid Control Technique to Improve Light Load Efficiency while Meeting the Hold-up Time Requirement for Two-Stage Server Power," IEEE Trans. on Power Electronics, Vol. 29, No.9, pp. 4763-4775, 2014.
 20. Y. S. Lai and J. S. Su, "Novel On-Line Maximum Duty Point Tracking Technique to Improve Two-Stage Server Power Efficiency and Investigation into its Impact on Hold-up Time," IEEE Trans. on Industrial Electronics, Vol. 61, No. 5, pp. 2252 - 2263, 2014.
 21. Y. S. Lai, W. T. Lee, Y. K. Lin and J. F. Tsai, "Integrated inverter/converter circuit and control technique of motor drives with dual mode control for EV/HEV applications," IEEE Trans. on Power Electronics, Vol. 29, No. 3, pp. 1358-1365, 2014.
 22. Y. S. Lai and B. Y. Chen, "New random PWM technique for full-bridge DC/DC converter with harmonics intensity reduction and considering efficiency," IEEE Trans. on Power Electronics, Vol. 28, No. 11, pp. 5013 - 5023, 2013.
 23. B. Y. Chen and Y. S. Lai, "Corrections to Switching control technique of phase-shift controlled full bridge converter to improve efficiency under light load and standby conditions without additional auxiliary components," IEEE Trans. on Power Electronics, Vol. 28, No. 8, pp. 4120, August 2013.
 24. Y. S. Lai, Y. T. Chang and B. Y. Chen, "Novel random switching PWM technique with constant sampling frequency and constant inductor average current for digital-controlled converter," IEEE Trans. on Industrial Electronics, Vol. 60, No. 8, pp. 3126-3135, 2013.
 25. Y. S. Lai, Y. K. Lin and C. W. Chen, "New hybrid pulse-width modulation technique to reduce current distortion and extend current reconstruction range for three-phase inverter using only DC-link sensor," IEEE Trans. on Power Electronics, Vol. 28, No. 3, pp. 1331 – 1337, 2013.
 26. Y. S. Lai and C. A. Yeh, "Response to the Comments on Predictive Digital-Controlled Converter with Peak Current-Mode Control and Leading-Edge Modulation", IEEE Trans. on Industrial Electronics, Vol. 60, No. 1, pp. 235-238, 2013.
 27. Y.S. Lai, C. A. Yeh and K. M. Ho, "A family of predictive digital-controlled PFC under boundary current mode control," IEEE Trans. on Industrial Informatics, Vol. 8, No. 3, pp. 448 - 458, 2012.
 28. P. Y. Lin and Y. S. Lai, "Voltage control technique for the extension of DC-link voltage utilization of finite speed SPMSM drives," IEEE Trans. on Industrial Electronics, Vol. 59, No. 9, pp. 3392-3402, 2012.
 29. B. Y. Chen and Y. S. Lai, "New digital-controlled technique for battery charger with constant current and

- voltage control without current feedback," *IEEE Trans. on Industrial Electronics*, Vol. 59, No. 3, pp. 1545 – 1553, 2012.
30. C. A. Yeh and Y. S. Lai, "Digital pulse-width modulation technique for a buck DC/DC converter to reduce switching frequency," *IEEE Trans. on Industrial Electronics*, Vol. 59, No. 1, pp. 550-561, 2012.
 31. Y. K. Lin and Y. S. Lai, "Pulse-width modulation technique for BLDCM drives to reduce commutation torque ripple without calculation of commutation time," *IEEE Trans. on Industry Applications*, Vol. 47, No. 4, pp. 1786-1793, 2011.
 32. Y. S. Lai and Y. K. Lin, "A unified approach to zero-crossing point detection of back-EMF for brushless DC motor drives without current and hall sensors," *IEEE Trans. on Power Electronics*, Vol. 26, No. 6, pp. 1704-1173, 2011.
 33. P. Y. Lin and Y. S. Lai, "Novel voltage trajectory control for field weakening operation of induction motor drives," *IEEE Trans. on Industry Applications*, Vol. 47, No. 1, pp. 122-127, Jan. 2011.
 34. K. M. Ho, C. A. Yeh and Y. S. Lai, "Novel digital-controlled transition current mode control and duty compensation techniques for interleaved power factor corrector," *IEEE Trans. on Power Electronics*, Vol. 25, No. 12, pp. 3085 - 3094, Dec. 2010.
 35. P. S. Chen and Y. S. Lai, "Effective EMI filter design method for three-phase inverter based upon software noise separation," *IEEE Trans. on Power Electronics*, Vol. 25, No. 11, pp. 2797 - 2806, 2010.
 36. L. R. Chen, C. S. Tsai, Y. L. Lin and Y. S. Lai, "A biological swarm chasing algorithm for tracking the PV maximum power point," *IEEE Trans. on Energy Conversion*, Vol. 25, No. 2, pp. 484-493, June 2010.
 37. B. Y. Chen and Y. S. Lai, "Switching control technique of phase-shift controlled full bridge converter to improve efficiency under light load and standby conditions without additional auxiliary components," *IEEE Trans. on Power Electronics*, Vol. 25, No. 4, pp. 1001-1012, April 2010.
 38. Y. T. Chang and Y. S. Lai, "Parameter tuning method for digital power converter with predictive current mode control," *IEEE Transactions on Power Electronics*, Vol. 24, No. 12, pp. 2910-2919, Dec. 2009.
 39. K. Y. Lee and Y. S. Lai, "Novel circuit design for two-stage AC/DC converter to meet standby power regulations," *IET Power Electronics*, Vol. 2, No. 6, pp. 625-634, Nov. 2009.
 40. Y. T. Chang and Y. S. Lai, "On-line parameter tuning technique for predictive current mode control operating in boundary conduction mode," *IEEE Trans. on Industrial Electronics*, Vol. 56, No. 8, pp. 3214-3221, Aug. 2009.
 41. Y. S. Lai and C. A. Yeh, "Predictive digital-controlled converter with peak current mode control and leading edge modulation," *IEEE Trans. on Industrial Electronics*, Vol. 56, No. 6, pp. 1854-1863, 2009.
 42. Y. K. Lin and Y. S. Lai, "Dead-time elimination of PWM-controlled inverter/converter without separate power sources for current polarity detection circuit," *IEEE Trans. on Industrial Electronics*, Vol. 56, No. 6, pp. 2121-2127, 2009.
 43. Y. S. Lai and Y. K. Lin, "Novel back-EMF detection technique of brushless DC motor drives for wide range control without using current and position sensors," *IEEE Trans. on Power Electronics*, Vol. 23, No. 2, pp.

934-940, 2008.

44. Y. S. Lai and Y. K. Lin, "Assessing pulse-width modulation techniques for brushless dc motor drives," *IEEE Industry Application Magazines*, pp. 34-44, Sep./Oct., 2008.
45. Y. S. Lai, P. S. Chen, S. K. Lee, and J. Chou, "Optimal PWM technique for inverter control with considering the dead-time effects-Part II: applications to IM drives with diode front end," *IEEE Trans. on Industrial Applications*, Vol. 40, No. 6, pp. 1613-1620, 2004.
46. Y. S. Lai and F. S. Shyu, "Optimal PWM technique for inverter control with considering the dead-time effects-Part I: basic development," *IEEE Trans. on Industrial Applications*, Vol. 40, No. 6, pp. 1605-1612, 2004.
47. Y. S. Lai, W. K. Wang, and Y. C. Chen, "Novel switching techniques for reducing the speed ripple of AC drives with Direct Torque Control" *IEEE Trans. on Industrial Electronics*, Vol. 51, No. 4, pp. 768-775, 2004.
48. Y. S. Lai, F. S. Shyu, and Y. H. Chang, "Novel loss reduction pulse-width modulation technique for brushless DC motor drives fed by MOSFET inverter," *IEEE Trans. on Power Electronics*, Vol. 19, No. 6, pp. 1646-1652, 2004.
49. Y. S. Lai, F. S. Shyu, and S. S. Tseng "New initial position detection technique for three-phase brushless DC motor without position and current sensors," *IEEE Trans. on Industrial Applications*, Vol. 39, No. 2, pp. 485-491, March/April 2003.
50. Y. S. Lai and C. J. Lin, "New hybrid fuzzy controller for direct torque control induction motor drives," *IEEE Trans. on Power Electronics*, Vol. 18, No. 15, pp. 1211-1219, September 2003.
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