

An-Chyau Huang, Ph.D

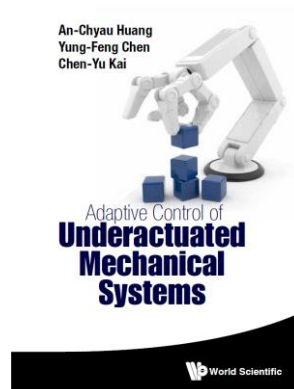
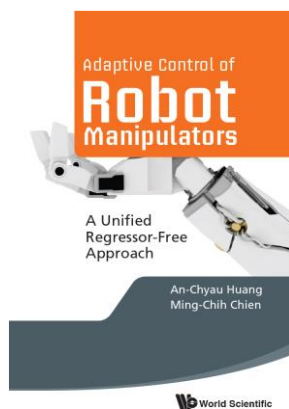
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Research Fields: Nonlinear Control, Adaptive Control, Neural Nets

Courses: Applied Electronics, Nonlinear Control, Adaptive Control

Books:

1. An-Chyau Huang and Ming-Chih Chien, *Adaptive Control of Robot Manipulators – A Unified Regressor-Free Approach*, World Scientific, 2010.
2. An-Chyau Huang, Yung-Feng Chen and Chen-Yu Kai, *Adaptive Control of Underactuated Mechanical Systems*, World Scientific, 2015.



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2. D. M. Auslander, A. C. Huang and M. Lemkin, "A Design and Implementation Methodology for Real Time Control of Mechanical Systems," *Mechatronics*, Vol. 5, No.7, pp. 811-832, 1995. (SCI, EI)
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4. A. C. Huang and Y. J. Chen, "Safe Control of Vehicle Entry Operations in Automated Highway Systems," *Journal of Chinese Society of Mechanical*

- Engineers*, Vol. 20, No. 6, pp.543-552, 1999. (EI)
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 8. A. C. Huang and Y. F. Chiang, "Function Approximation Using Serial Input Neuron," *Neurocomputing*, Vol. 47, No. 1-4, pp. 85-101, Aug. 2002. (SCI, EI)
 9. A. C. Huang and Y. F. Chiang, "Design of an Artificial Neural Computing Architecture for Temporal Sequence Processing," *International Journal of Fuzzy Systems*, Vol.4 , No.3 , pp.808-815, 2002. (EI,SCI)
 10. A. C. Huang and S. C. Ko, "Translation and Scale-invariant Pattern Recognition Based on the Hamming Network," *International Journal of Computer Applications in Technology*, Vol.16, No.1, pp.39-46, 2003.
 11. A. C. Huang, "Control of Distributed Mechatronic Systems—Transition Logic Approach," *International Journal of Computer Applications in Technology*, Vol.17, No.1, pp.57-61, 2003.
 12. A. C. Huang, "Model Reference Adaptive Control of a Class of Non-autonomous Systems Using Serial Input Neuron," *Neurocomputing*, Vol.51 , No.1 , pp.413-423, 2003. (SCI, EI)
 13. A. C. Huang and Y. C. Chen, "Adaptive Sliding Control for Single-Link Flexible-Joint Robot with Mismatched Uncertainties," *IEEE Transactions on Control Systems Technology*, vol. 12, no. 5, pp.770-775, Sept. 2004. (SCI, EI)
 14. A. C. Huang and Y. C. Chen, "Adaptive Multiple-Surface Sliding Control for Non-Autonomous Systems with Mismatched Uncertainties," *Automatica*, vol. 40, issue 11, pp.1939-1945, Nov. 2004. (SCI, EI)
 15. M. C. Chien and A. C. Huang, "Adaptive Impedance Control of Robot Manipulators based on Function Approximation Technique," *Robotica*, vol. 22, issue 04, pp.395-403, August, 2004. (SCI, EI)
 16. P. C. Chen and A. C. Huang, "Adaptive Sliding Control of Active Suspension Systems based on Function Approximation Technique," *Journal of Sound and Vibration*, vol. 282, issue 3-5, pp. 1119-1135, April 2005. (SCI, EI)
 17. P. C. Chen and A. C. Huang, "Adaptive Multiple-surface Sliding Control of

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- 18.P. C. Chen and A. C. Huang, “Adaptive Sliding Control of Active Suspension Systems with Uncertain Hydraulic Actuator Dynamics, *Vehicle System Dynamics*, vol. 44, no. 5, pp357-368, May 2006. (SCI, EI)
 - 19.A. C. Huang, S. C. Wu and W. F. Ting, “An FAT-based Adaptive Controller for Robot Manipulators without Regressor Matrix: Theory and Experiments,” *Robotica*, vol. 24, pp. 205-210, 2006. (SCI, EI)
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 - 21.M. C. Chien and A. C. Huang, “Adaptive control of flexible-joint electrically-driven robot with time-varying uncertainties,” *IEEE Transactions on Industrial Electronics*, vol. 54, no. 2, pp 1032-1038, April 2007. (EI, SCI)
 - 22.M. C. Chien and A. C. Huang, “Adaptive control of electrically-driven robot without computation of Regressor matrix,” *Journal of Chinese Institute of Engineers*, vol.30, no. 5, pp. 855-862, July 2007. (EI, SCI)
 - 23.Y. C. Tsai and A. C. Huang, “FAT based adaptive control for pneumatic servo system with mismatched uncertainties,” *Mechanical Systems and Signal Processing*, vol. 22, no. 6, pp.1263-1273, Aug. 2008. (EI, SCI)
 - 24.Y. C. Tsai and A. C. Huang, “Multiple-Surface Sliding Controller Design for Pneumatic Servo Systems, “*Mechatronics*, No. 18, pp. 506-512, Nov. 2008. (EI, SCI)
 - 25.M. C. Chien and A. C. Huang, “Design of a FAT-based Adaptive Visual Servoing for Robots with Time Varying Uncertainties,” *International Journal of Optomechatronics*, vol. 4, Issue 2, pp.93-114, 2010. (EI, SCI)
 - 26.T. F. Lee and A. C. Huang, “Vibration Suppression in Belt-driven Servo Systems Containing Uncertain Nonlinear Dynamics,” *Journal of Sound and Vibration*, vol. 330, Issue 1, pp.17-26, 2011. (EI, SCI)
 - 27.P. H. Liang, T. F. Lee and A. C. Huang, “Friction Compensation in Servo Applications,” *Journal of Chinese Society of Mechanical Engineers*, Vol. 32, No. 1, pp.56-60, 2011. (EI, SCI)
 - 28.M. C. Chein and A. C. Huang, “Adaptive Impedance Controller Design for Flexible-joint Electrically-driven Robots without Computation of the Regressor Matrix,” *Robotica*, vol.30, pp.133-144, 2012. (EI, SCI)
 - 29.Y. F. Chen and A. C. Huang, “Controller Design for a Class of Underactuated Mechanical Systems,” *IET Control Theory & Applications*, vol.6, Issue 1,

- pp103-110, 2012 (EI, SCI)
- 30.C. Y. Kai and A. C. Huang, "Adaptive Control of Brushless DC Motors without Model Reduction," *Applied Mechanics and Materials*, Special Issue on Advances in Mechatronics and Control Engineering, vol. 278-280, pp. 1409-1412, 2013.(EI)
 - 31.C. Y. Kai and A. C. Huang, "A Regressor-free Adaptive Controller for Robot Manipulators without Slotine and Li's Modification," *Robotica*, vol. 31, Issue 7, pp.1051-1058, Oct. 2013. (EI, SCI)
 - 32.C. Y. Kai and A. C. Huang, "Linearization of Rate-dependent Nonlinearity with a Compensator in Feedback Configuration," *Mechanical Systems and Signal Processing*, vol. 39, pp. 333-341, 2013. (EI, SCI)
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2. D. M. Auslander, M. Lemkin, and A. C. Huang, "Control of Complex Mechanical Systems," Proceedings of IFAC, 1993.
3. A. C. Huang and D. M. Auslander, "Control of a Class of Nonlinear Systems using Backstepping," American Control Conference, 1994.
4. D. M. Auslander, M. Lemkin, and A. C. Huang, "Communication Needs for Multiprocessor Mechatronic Systems," Proceedings of ASEE, vol. 2, pp. 852-857, 1994.
5. M. Lemkin, P. H. Yang, A. C. Huang, J. Jones, and D. M. Auslander, "Velocity Estimation from Widely Spaced Encoder Pulses," American Control Conference, 1995.

6. A. C. Huang, "Sufficient Conditions for Static/Dynamic Nonlinear Stabilization," Automatic Control Conference, Taipei, 1997.
7. A. C. Huang, "Stabilization of a Class of Nonlinear Systems," Proceedings of the IASTED International Conference on Control, pp378-381, Cancun, Mexico, 1997.
8. A. C. Huang, G. C. Chuang and Y. J. Chen, "Robust Longitudinal Control of a Platoon of Vehicles," Automatic Control Conference, Yulin-Lin, Taiwan, 1998.
9. A. C. Huang and Y. F. Chiang, "Design of an Artificial Neural Computing Architecture for Temporal Sequence Processing," 6th Conference on Fuzzy Theory and its Applications, Taiwan, 1998.
10. A. C. Huang and Y. J. Chen, "Safe Control of Vehicle Entry Operation in AHS," 11st National Automation Conference, July, 1999.
11. A. C. Huang and Y. J. Chen, "Safety Oriented Maneuvers for AHS," 1st International Conference on Intelligent Transportation Systems, May, 1999.
12. A. C. Huang and S. C. Ko, "Design of an Invariant Pattern Recognition System," 11st National Automation Conference, July, 1999.
13. A. C. Huang, "SIN-based Model Reference Adaptive Control of a Class of Nonlinear Systems," International Conference of Automation, pp. 657-662, May 9-11, 2000.
14. A. C. Huang and Y. S. Kuo, "Model Reference Adaptive Control of Linear Time Varying Systems," Automatic Control Conference, pp.72-77, March 9-10, 2000.
15. A. C. Huang, C. H. Chen and Y. S. Kuo, "Parameter Estimation of Linear Time Varying Systems," National Conference of Mechanical Engineering, 2000.
16. A. C. Huang and Y. S. Kuo, "Sliding Control of Nonlinear Systems Using Fourier Series as Function Approximator of Unknown Bounds Time-Varying Uncertainties," National Conference of Mechanical Engineering, 2000.
17. A. C. Huang and Y. J. Chen, "Adaptive Multiple-Surface Sliding Control for Single-Link Flexible-Joint Robots with Mismatched Uncertainties," National Conference of Mechanical Engineering, 2001.
18. P. C. Chen and A. C. Huang, "Adaptive Sliding Control of Active Suspension Systems with Uncertain Hydraulic Actuator Dynamics," 7th International Conference on Automation Technology, 2003.
19. P. C. Chen and A. C. Huang, "Adaptive Multiple Surface Sliding Control of Active Suspension System Based on Function Approximation Technique," National Conference of Mechanical Engineering, 2003.
20. A. C. Huang, M. S. Chuang and M. C. Chien, "Adaptive Optimal Controller Design for Nonlinear Systems," National Conference of Mechanical Engineering, 2003.
21. 陳品羚、簡銘志、陳柏璋、黃安橋 "線性時變溫控系統之適應控制" 機械工

程研討會，2003.

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31. M. C. Chien and A. C. Huang, "Regressor-Free Adaptive Impedance Control of Flexible-Joint Robots Using FAT," American Control Conference, 2006.
32. M. C. Chien and A. C. Huang, "FAT-based adaptive control for flexible-joint robots without computation of the regressor matrix," IEEE SMC 2006.
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35. 陳永峰、黃安橋 "欠驅動系統之適應多重滑動面控制" 機械工程研討會，2008.
36. Y. C. Tsai and A. C. Huang, "Adaptive Controller Design for Pressure-Sensor

- Free Pneumatic Servo Systems,” Proceedings of CSME 25th National Conference on Mechanical Engineering, B15-04, Nov. 2008.
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 38. M. C. Chien and A. C. Huang, “FAT-based Adaptive Visual Servoing for Robots with Varying Uncertainties,” IEEE ICRA, Japan, 2009.
 39. A. C. Huang and M. C. Chien, “Design of a Regressor-free Adaptive Impedance Controller for Flexible-joint Electrically-driven Robots,” IEEE ICIEA, China, 2009.
 40. 陳永峰、黃安橋 “未知時變天車系統之適應控制器設計” 機械工程研討會，2009.
 41. 蓋震宇、黃安橋 “用於變動性外力之主動式減振器設計” 機械工程研討會，2009.
 42. 李銓鋒、黃安橋 “皮帶驅動伺服系統之振動抑制控制” 第 18 屆全國自動化科技研討會，June, 2010.
 43. Yung-Feng Chen and An-Chyau Huang, “Adaptive Control for a Class of Underactuated Systems with Mismatched Uncertainties,” 29th Chinese Control Conference, Beijing, PRC, July 29-31, 2010.
 44. Chen-Yu Kai and An-Chyau Huang, “FAT-based Approximate Feedback Linearization of Rate-dependent Nonlinear Dynamics,” 30th Chinese Control Conference, July 22-24, 2011, Yantai, China.
 45. 林裕茂、蓋震宇、黃安橋 “磁浮系統適應控制之理論與實作” 機械工程研討會，2011.
 46. 陳永峰、黃安橋 “混沌系統同步化與安全通信設計” 機械工程研討會，2011.
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 48. 楊泓儒、蓋震宇、黃安橋 “虛擬四連桿機構設計與實作” 機械工程研討會，2011.
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 51. Yu-Mao Lin, Chen-Yu Kai and An-Chyau Huang, “Adaptive Control of Horizontal Magnetic Levitation System Subject to External Disturbances,” 7th IEEE Conference on Industrial Electronics and Applications, 2012, Singapore.
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53. C. Y. Kai and A. C. Huang, "Adaptive LQ control of robot manipulators," ICIEA, Hangzhou, China, 2014.

Book Chapters

1. M. C. Chien and A. C. Huang, "An Adaptive Controller Design for Flexible-Joint Electrically-Driven Robots with Consideration of Time-Varying Uncertainties," Chapter 5 in the book *Frontiers in Adaptive Control*, I-Tech Education and Publishing, Vienna, Austria, 2009.
2. M. C. Chien and A. C. Huang, "A Regressor-free Adaptive Control for Flexible-joint Robots based on Function Approximation Technique," Chapter 2 in the book *Advances in Robot Manipulators*, I-Tech Education and Publishing, Vienna, Austria, 2010.

Other Publications

1. A. C. Huang, Application of Robot Impedance Control in Manufacturing, *National Taiwan Institute of Technology*, Master Thesis, 1989. (in Chinese)
2. A. C. Huang, Nonlinear Controller Design of a Class of Dynamical Systems, *University of California at Berkeley*, Ph.D. Dissertation, 1994.
3. A. C. Huang, Study of Asymmetric Control on IVHS, *NSC Technical Report*, NSC-86-2212-E-011-026, 1997.
4. A. C. Huang, Coordination/Regulation Layer Control of IVHS, *NSC Technical Report*, NSC-87-2218-E-011-014, 1998.
5. A. C. Huang, Control of Distributed Mechatronic Systems – Transition Logic Approach, *NSC Technical Report*, NSC-88-2212-E-011-016, 1999.
6. 黃緒哲, 黃安橋, 王朝正, 「工業用機器人之性能標準與檢驗方法及其他相關標準之調合與草案研擬」, 經濟部標準檢驗局國家標準草擬結案報告, 1999。
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8. 黃安橋, 「智慧型車路系統簡介」, 機電整合雜誌, 十一月號, 1999。
9. 雷添壽, 黃安橋, 蔡高岳, 「工業用機器人測試設備及量測方法等相關國家標準草案研擬」, 經濟部標準檢驗局國家標準草擬結案報告, 2000。
10. 黃安橋, 「複雜機電整合系統之控制」, 機電整合雜誌, 一月號, 2000。
11. A. C. Huang, Research on Function Approximation Ability of SIN and Its Application on Feedback Linearization Control, *NSC Technical Report*,

- NSC-89-2213-E-011-0074, 2000.
12. A. C. Huang, Adaptive Control of Uncertain Flexible Joint Robot Using Orthonormal Function Approximation, *NSC Technical Report*, NSC-90-2212-E-011-056, 2002.
 13. A. C. Huang, Adaptive Control of Flexible Link Robot Manipulators, *NSC Technical Report*, NSC-91-2212-E011-050, 2003.
 14. A. C. Huang, An Adaptive Controller for Robot Manipulators Without Regressor Matrix, *NSC Technical Report*, NSC-92-2212-E011-018, 2004.
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 18. A. C. Huang, Adaptive Controller Design Based on Function Approximation Technique for the Control of the Acoustic Field in a Duct, *NSC Technical Report*, NSC-94-2212-E-011-033, 2006.
 19. A. C. Huang, Design and Realization of a Precision Positioning Maglev Control System, *NSC Technical Report*, NSC-95-2221-E-011-161, 2007.
 20. A. C. Huang, Regreesor-Free Adaptive Control of Electrically-Driven Robots, *NSC Technical Report*, NSC-96-2212-E-011-128, 2008.
 21. A. C. Huang, Friction Estimation and Adaptive Control of High Precision Servo Systems with Transient Analysis, *NSC Technical Report*, NSC-97-2221-E-011-095, 2009.
 22. A. C. Huang, Adaptive Control for Weighted Synchronization of Multiple Motors in Automation Systems, *NSC Technical Report*, NSC-98-2221-E-100-077, 2010.
 23. A. C. Huang, Design of High Performance Auto-tuning Temperature Controller for Industrial Applications, *NSC Technical Report*, NSC-99-2221-E-011-024, 2011.
 24. A. C. Huang, Force-Sensor-Free Compliant Motion Controller Design for Motor-Driven Systems, *NSC Technical Report*, NSC-100-2221-E-100-021, 2012.
 25. A. C. Huang, A New Paradigm for the Adaptive Controller Design of Robot Manipulators, *NSC Technical Report*, NSC-101-2221-E-011-104, 2013.
 26. A. C. Huang, A New Adaptive Impedance Controller Design of Robot Manipulators and its Verification, *NSC Technical Report*, NSC-102-2221-E-011-072, 2014.

Honors

1. Paper Award, 1998 Fuzzy Theory and Application Conference.
2. Best Paper Award, 2004 National Control Conference.
3. Editor-in-Chief, Mechatronics Magazine, 9/1999 ~ 8/2000.
4. General Chairman, PC-Based Control Systems Conference, Taipei, Taiwan, 2000.
5. 2001 Who's Who in the World.
6. 2005 Who's Who in Science and Engineering.
7. Asia/Pacific Who's Who, Vol. VI, 2006, Vol. VII, 2007, Vol. IX, 2009..
8. Asian Admirable Achievers (Vol. III), 2009.
9. IBC's Leading Educators of the World, 2005, 2007.
10. IBC's 21st Century Award for Achievement, 2006.
11. Recipient of the IBC's The Plato Award, 2007.
12. Korea Education Fair, Taiwan Representative, Seoul, 2005.
13. Teaching Award, ME Department, NTUST. (8 times)
14. Excellent Teaching Award, NTUST, 2008.
15. Advisor of the Best Project Award winner team, NTUST, 2005, 2006.
16. Advisor of the Ph.D. student winning the Dissertation Award by the Chinese Society of Mechanical Engineers, 2005.
17. Best Paper Award Chairman, CACS International Automatic Control Conference, 2009.