

NAME: Sing Kiong NGUANG

CURRENT POSITION: Professor  
Chair of Control Engineering  
Director of Systems and Control Research

UNIVERSITY: Electrical & Computer Engineering,  
The University Auckland, New Zealand

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EDUCATIONAL QUALIFICATIONS: [Tertiary only]

1995 University of Newcastle (Aust.), PhD, Electrical Engineering

1992 University of Newcastle (Aust.), BE (Hon. I), Electrical Engineering

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PREVIOUS APPOINTMENTS:

1995-now Lecturer, Senior Lecturer, Associate Professor and Chair Professor, University of Auckland, New Zealand

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SIGNIFICANT DISTINCTIONS / AWARDS:

2016 h-index 32, Scopus

2014 Visiting Professor, UTeM, Melaka, Malaysia

2013 New Zealand TEC Assigned PBRF Quality Category: A (highest research rating)

2013 Visiting Professor at Yuan Ze University, Taiwan

2011 Overseas Professor, Jiangnan University, China

2010 Visiting Professor at TU Berlin, Germany and National Tsinghua University, Taiwan.

2009 Signal Processing (Elsevier, Impact factor: 1.256) most cited award

2009-2010 Alexander von Humboldt Foundation of Germany, Fellow Return Award

2009 Top 15 Faculty of Engineering Teacher awards

2006 New Zealand TEC Assigned PBRF Quality Category: A (highest research rating)

2004-2005 Alexander von Humboldt Foundation of Germany, Research Award

2004 Visiting Professor at Duisburg-Essen University, Germany and Tsinghua University, Peking University, Zhejiang University, Shandong University, China

2003 2002 Top Twenty Faculty Teachers, School of Engineering

2002 Supervised Mr Qihong Ke, who won the ICNPAA 2002 Best Student Paper Award awarded at the Fourth International Conference on Non-linear Problems in Aviation and Aerospace held in Melbourne, Florida, USA.

2002 Royal Society of New Zealand, Marsden Award.

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PROFESSIONAL SOCIETIES / SERVICE / OTHER ACTIVITIES:

- Associate Editor, IEEE Access (2015-)
  - Associate Editor, International Journal of Control, Automation, and Systems (IJCAS) (2015-)
  - Chief-Editor of International Journal of Sensors, Wireless Communications and Control (2009-)
  - Member, Editorial Board of the International Journal of System Sciences (2007-)
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## RESEARCH SPECIALTIES / CAREER:

### Summary Statement:

My research interests are very broad as well as deep. I have published 9 books, more than 190 refereed journal papers and 100 conference papers. Most publications are in the top quality (Q1) international journals. My major contributions are: 1) nonlinear control design, 2) networked control and 3) fuzzy linear modelling for complex nonlinear systems.

### Patent:

Andrew Haynes, Pengcheng Liu, Ashton Partridge and Sing Kiong Nguang, *Photovoltaic Systems*, Patent No: WO2013081478 A1

### Books:

1. Leizhi Chen, Sing Kiong Nguang and Xiao Dong Chen, *Modelling and Optimization of Biotechnological Processes: Artificial Intelligence Approaches* ISBN: 3-540-30634-X Springer-Verlag 2006
2. Wudhichai Assawinchaichote, Sing Kiong Nguang and Shi Peng, *Fuzzy Control and Filtering of Uncertain Nonlinear Systems*, ISBN: 3-540-37011-0, Springer Verlag, 2006
3. Chengmo Xiao and Sing Kiong Nguang, *Modelling and Control of Yachts*, ISBN: 978-1-60741-430-8, Nova Science Publishers, Inc., New York, 2009
4. Dan Huang and Sing Kiong Nguang, *Robust control of Uncertain networked control systems with Random Delays*, Springer Verlag, ISBN:978-1-84882-667-9, 2009
5. Yi-Shin Lee, Sing Kiong Nguang and Ashton Partridge, *MPPT for Photovoltaic Array under Partially Shaded Conditions*, 978-3-639-36546-7, VDM Verlag, 2011
6. Faiz Rasool and Sing Kiong Nguang, *Networked Control Systems*, LAP LAMBERT Academic Publishing, ISBN-13: 978-3659520365, 2014.
7. Nitish Patel, Sing Kiong Nguang and George Coghill, *Real Time Implementation of Fuzzy and Neuro Controllers Using Bit-Streams*, accepted Springer Verlag, 2014
8. Jian Zhang, Akshya Swain and Sing Kiong Nguang *Robust Observer-Based Fault Diagnosis for Nonlinear Systems Using MATLAB®*, accepted Springer Verlag 2015.
9. Shakir Saat and Sing Kiong Nguang, *Controller Synthesis for Nonlinear Discrete Polynomial Systems*, accepted Elsevier, 2016

### Book Chapters:

1. Ramin Vali, Stevan Berber and Sing Kiong Nguang, *Synchronization, Planning and Optimisation of 3G and 4G Wireless Networks*, Editor: J.I. Agbinya, River Publishers, ISBN: 978-87-92329-24-0, 2009, pp. 445-457.
2. Dan Huang and Sing Kiong Nguang, *Roust Fault Estimator Design for Uncertain Nonlinear Networked Control Systems*, Artificial Intelligence Resources in Control and Automation Engineering, accepted 2011.

### Selected Refereed Journal Publications:

#### Fuzzy Systems

1. Peng Shi and Sing Kiong Nguang,  $H_{\infty}$  Output Control of Fuzzy System Models Using Linear Output Controllers, *Systems Analysis Modelling Simulation*, 42, pp. 1439-1453, 2002.
  2. Peng Shi and Sing Kiong Nguang,  $H_{\infty}$  Output Feedback Control of Fuzzy System Models Under Sampled Measurements, *Computers and Mathematics with Applications*, 46, pp. 705-717, 2003.
  3. Sing Kiong Nguang and Shi Peng, *Robust control of fuzzy time-delay models*, *Systems Analysis Modelling Simulation*, Vol. 43, pp 100 – 120, 2003
  4. Sing Kiong Nguang and Peng Shi, *Fuzzy output feedback control design for nonlinear systems: An LMI approach*, *IEEE Trans. On Fuzzy Systems*, 11, no. 3, pp331-340, 2003.
  5. Sing Kiong Nguang and Shi Peng,  $H_{\infty}$  Output Feedback Control of Fuzzy System Models Under Sampled Measurements, *Automatica*, 39, pp. 2169-2174, 2003.
  6. Sing Kiong Nguang and Wudhichai Assawinchaichote  $H_{\infty}$  Filtering for Fuzzy Dynamical Systems with Pole Placement Constraints, *IEEE Transactions on Circuits and Systems*, Part 1, 50, pp. 1503-1508, 2003.
  7. Wudhichai Assawinchaichote and Sing Kiong Nguang, *Fuzzy  $H_{\infty}$  Control Design for Nonlinear*
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*Singularly Perturbed Systems with Pole Placement Constraints: An LMI Approach*, IEEE Transactions on Systems, Man and Cybernetics, Part B, pp. 579-588, 2004

8. Wudhichai Assawinchaichote and Sing Kiong Nguang,  *$H_\infty$  Filtering for Nonlinear Singularly Perturbed Systems with Pole Placement Constraints: An LMI Approach*, IEEE Transactions on Signal Processing, pp.1659-1667, 2004.
  9. Wudhichai Assawinchaichote, Sing Kiong Nguang and Shi Peng, *Robust  $H_\infty$  Control for Nonlinear Singularly Perturbed Systems: An LMI Approach*, Automatica, pp. 2147-2152, 2004
  10. Wudhichai Assawinchaichote and Sing Kiong Nguang,  *$H_\infty$  Control Design for Time-Delay Nonlinear Systems with Markovian jumps: An LMI Approach*, Journal of Nonlinear Dynamics and Systems Theory, 4, pp. 257-272, 2004
  11. Wudhichai Assawinchaichote and Sing Kiong Nguang, *Robust  $H_\infty$  Fuzzy Filter Design for Uncertain Nonlinear Descriptor Systems*, The International Journal of Artificial Intelligence and Machine Learning, pp. 15-21, 2004.
  12. Sing Kiong Nguang and Shi Peng,  *$H_\infty$  Output Feedback Control Design for Uncertain Fuzzy Systems with Multiple Time Scales: An LMI Approach*, European Journal of Control, 2 , pp. 157-166, 2005
  13. Dan Huang and Sing Kiong Nguang, *Robust Static  $H_\infty$  Output feedback control for fuzzy systems: An ILMI Approach*, IEEE Transactions on Systems, Man and Cybernetics B, 36, pp. 216-222, 2006
  14. Sing Kiong Nguang and Peng Shi, *Robust  $H_\infty$  Output Feedback Control Design for Fuzzy Dynamic Systems with Quadratic  $D$  Stability Constraints: An LMI Approach*, Information Sciences, 176, pp. 2161-2191, 2006
  15. Wudhichai Assawinchaichote and Sing Kiong Nguang, *Robust  $H_\infty$  State-Feedback Control for Uncertain Fuzzy Markovian Jump Systems: LMI-Based Design*, International Journal of Computational Intelligence, 3, pp.187-194, 2006.
  16. Wudhichai Assawinchaichote and Sing Kiong Nguang, *Fuzzy  $H_\infty$  Output Feedback Control Design for Nonlinear Singularly Perturbed Systems with Pole Placement Constraints: An LMI Approach*, IEEE Transactions on Fuzzy Systems, 14, pp. 361-371, 2006.
  17. Sing Kiong Nguang, and Peng Shi, *Robust  $H_\infty$  Output Feedback Control Design for Fuzzy Systems with Markovian jumps: An LMI approach* Journal of Dynamic Systems, Measurement and Control, Vol. 128, 617-625, 2006
  18. Sing Kiong Nguang and Wudhichai Assawinchaichote, *Comments on "H-infinity Fuzzy Control Design for Nonlinear Singularly Perturbed Systems With Pole Placement Constraints: An LMI Approach"*, IEEE Transactions on Systems, Man and Cybernetics B, Vol. 36, pp. 963-964, 2006
  19. Sing Kiong Nguang, Shi Peng and Steven Ding, *Delay Dependent Fault Estimation for Uncertain Time Delay Nonlinear Systems: An LMI Approach*, International Journal of Robust and Nonlinear Control, 16, pp. 913-933, 2006
  20. Sing Kiong Nguang, Ping Zhang and Steven Ding, *Parity relation based fault estimation for nonlinear systems: An LMI approach*, Fault Detection, Supervision and Safety of Technical Processes 2006, pp. 366-371, 2007
  21. Sing Kiong Nguang and Peng Shi, *Delay-dependent  $H_\infty$  filtering for uncertain delay nonlinear systems: An LMI Approach*, IET Control Theory and Appl., vol. 1, pp. 133-140 2007.
  22. Dan Huang and Sing Kiong Nguang, *Static Output feedback control for nonlinear systems: An ILMI Approach*, Information Sciences, Vol. 177, pp. 3005-3015, 2007
  23. Wudhichai Assawinchaichote, Sing Kiong Nguang, and Peng Shi , *Robust Fuzzy  $H_\infty$  Filter Design for Singularly Perturbed Systems with Markovian jumps: An LMI Approach*, Information Sciences, Vol. 177, pp. 1699-1714, 2007
  24. Sing Kiong Nguang, Ping Zheng and Steven Ding, *Parity Relation Based Fault Estimation for Nonlinear Systems: An LMI Approach*, Int. Journal of Automation and Computing, Vol. 4, 2, 164-168, 2007
  25. Assawinchaichote and Sing Kiong Nguang, *Robust  $H_\infty$  Filter Design for Uncertain Fuzzy Descriptor Systems: LMI-Based Design'*, International Journal of Intelligent Technology, Vol. 2, 4,
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217-222, 2007.

26. Wudhichai Assawinchaichote, Sing Kiong Nguang and Shi Peng, *Robust  $H_\infty$  Control Design for Fuzzy Singularly Perturbed Systems with Markovian jumps: An LMI Approach*, IET Control Theory & Appl., Vol. 1, 4, pp. 893-908, 2007
  27. Sing Kiong Nguang, Wudhichai Assawinchaichote, and Peng Shi,  *$H_\infty$  Filter for Uncertain Nonlinear Systems with Markovian Jumps: An LMI Approach*, Circuits, Systems and Signal Processing, Vol. 26, 6, 853-874, 2007.
  28. Sing Kiong Nguang, Shi Peng and Steven Ding, *Fault Detection for Uncertain Fuzzy Systems: An LMI Approach*, IEEE Trans. On Fuzzy Systems, 15, no. 6, pp1251-1262, 2007
  29. Wudhichai Assawinchaichote, Sing Kiong Nguang, Peng Shi and El Kebir Boukas, *Fuzzy  $H_\infty$  State-Feedback Control Design for Nonlinear Systems with D-Stability Constraints: An LMI Approach*, Mathematics and Computers in Simulation, 78, p514-531, 2008
  30. Wudhichai Assawinchaichote, Sing Kiong Nguang and Peng Shi, *Synthesis of an LMI-based robust  $H_\infty$  fuzzy filter for uncertain nonlinear dynamic systems*, International Journal of Signal System Control and Engineering Application, vol. 1, pp. 15-25, 2008.
  31. Wudhichai Assawinchaichote and Sing Kiong Nguang, *Robust  $H_\infty$  fuzzy control design for nonlinear two-time scale system with Markovian jumps based on LMI approach*", Int. J. Computer Science, vol. 3, pp. 107-112, 2008.
  32. Wudhichai Assawinchaichote and Sing Kiong Nguang, *Robust  $H_\infty$  Fuzzy Control Design for Nonlinear Two-Time Scale System with Markovian Jumps based on LMI Approach*, Book Chapter. Advanced Technologies. Edited by Aleksandar Lazinica, Vienna: In-Tech Education and Publishing, 2009.
  33. Wudhichai Assawinchaichote and Sing Kiong Nguang, *Robust  $H_\infty$  fuzzy control design for nonlinear two-time scale system with Markovian jumps based on LMI approach*, Int. World Academy of Science, Engineering and Technology, (Paris, France), 612-617, 2009.
  34. Wudhichai Assawinchaichote, Sing Kiong Nguang, and Peng Shi, *"Robust  $H_\infty$  output feedback control design for uncertain fuzzy Markovian jump descriptor systems"*, Int. J. Advanced Computer Engineering, vol. 2, pp. 45-54, 2009.
  35. Sing Kiong Nguang, *Comments on "Fuzzy  $H_\infty$  Tracking Control for Nonlinear Networked Control Systems in T-S Fuzzy Model"*, IEEE Transactions on Systems, Man and Cybernetics, Part B, vol. 40, 957-957, 2010.
  36. Bor-Sen~Chen, Ching Han Chiang and Sing Kiong Nguang, *Robust  $H_\infty$  Synchronization Design of Nonlinear Coupled Network via Fuzzy Interpolation Method*, IEEE Circuit and Systems- Part I., 58, 2, 349-362, 2011
  37. Jie Wu, Sing Kiong Nguang, Jiong Shen, Guangyu Justin Liu, and Yi Guo Li, *Fuzzy Guaranteed cost tracking control for Boiler-Turbines Systems*, International Journal of Innovative Computing, Information and Control, 6, 12, 5575-5585, 2010
  38. Jie Wu, Sing Kiong Nguang, Jiong Shen, Guangyu Justin Liu, and Yi Guo Li, *Guaranteed Cost Nonlinear Tracking Control of a Boiler-Turbine Unit: An LMI approach*, International Journal of Systems Science, vol. 41, 1464-5319, 2010
  39. Jie Wu, Sing Kiong Nguang, Jiong Shen, Guangyu Justin Liu, and Yi Guo Li, *Robust  $H_\infty$  Tracking Control of Boiler-Turbines Systems*, ISA Transactions, vol. 49, 69-375, 2010
  40. Jie Wu Matthias Krug, Sing Kiong Nguang and Jiong Shen, *GA based nonlinear predictive switching control for a boiler-turbine system*, Journal of Control Theory and Applications, accepted 2010
  41. Matthias Krug, Sing Kiong Nguang, Jie Wu and Jiong Shen *GA-based model predictive control of Boiler-Turbine Systems*, International Journal of Innovative Computing, Information and Control, accepted 2010
  42. Jiwei Wen, Fei Liu and Sing Kiong Nguang, *Sampled-data predictive control for uncertain jump systems with partly unknown jump rates and time varying delay*, Journal of Franklin, 349, 1, 305-322, 2012
  43. Guangyu Liu, Sing Kiong Nguang and Yanxin Zhang, *Pole vault Performance for Anthropometric Variability via a Dynamical Optimal Control Model*, Journal of Biomechanics, 44, 3, 436-441, 2011.
  44. Jiwei Wen, Fei Liu and Sing Kiong Nguang, *Feedback Predictive Control for Constrained Fuzzy Systems with Markovian Jumps*, Asian Journal of Control, 14, 3, 795-806, 2012.
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45. Xiaojie Su, Peng Shi, Ligang Wu and Sing Kiong Nguang, *Induced  $\ell_2$  Filtering of Fuzzy Stochastic Systems With Time-Varying Delays*, IEEE Transactions on Systems, Man and Cybernetics, Part B 43, 4, 1251-1264, 2013
46. Jiwei Wen, Fei Liu and Sing Kiong Nguang, *Finite-time  $H_\infty$  control for discrete-time Markovian jump systems subject to average dwell time* Transactions of the Institute of Measurement and Control, accepted 2013.

## Nonlinear Control and Sampled-Data Systems

47. Sing Kiong Nguang, *Robust stabilisation for a class of time-delay nonlinear systems*, in proc.IEE part D, 1994, pp 285-288.
  48. Sing Kiong Nguang, *Robust nonlinear  $H_\infty$  output feedback control*, IEEE Trans. Automat. Contr., Vol. 41, July1996, pp 1003-1008.
  49. Sing Kiong Nguang and Minyue Fu, *Robust nonlinear  $H_\infty$  filtering*, Automatica, 32, August 1996, pp 1195-1199.
  50. Sing Kiong Nguang, *Global robust disturbance attenuation for a class of nonlinear system*, Int. Journal of Robust and Nonlinear contr., Vol. 1, January 1997, pp 75-84.
  51. Sing Kiong Nguang,  *$H_\infty$  control of a class of uncertain time-delay nonlinear systems*, Systems Analysis Modelling and Simulation, 1997, Vol. 29, pp. 57-70.
  52. Sing Kiong Nguang and Minyue Fu, *Global quadratic stabilisation of a class of nonlinear system*, Int. Journal of Robust and Nonlinear contr., Vol. 8, May 1998, pp483-497.
  53. Sing Kiong Nguang, *Robust  $L_2$  gain control of a class of nonlinear systems*, International. Journal of control, Vol. 72 , 1999, pp 1033-1043.
  54. Sing Kiong Nguang and Chih-Min Lin, *Robust  $H_\infty$  Filtering: A model matching approach*, International Journal of Systems Science, 1999, pp 1143-1151.
  55. Sing Kiong Nguang and Peng Shi, *On designing filters for sampled-data nonlinear systems*, Systems and Control Letters, Vol 41, 2000, pp 305-316
  56. Sing Kiong Nguang and Peng Shi, *Nonlinear  $H_\infty$  filtering of sampled-data systems* Automatica, Vol. 36, 2000, pp303-310.
  57. Chih-Min Lin, Chun-Hua Chen and Sing Kiong Nguang, *Simultaneous deadbeat tracking control of three plants: multivariable case*, International Journal of Control, Vol. 73, 2000, pp361-370.
  58. Sing Kiong Nguang, *Robust stabilisation of a class of time-delay structural nonlinear systems*, IEEE Trans. Auto. Contr., Vol. 45, 2000, pp 756 –762.
  59. Sing Kiong Nguang and Peng Shi, *Robust nonlinear  $H_\infty$  filtering of sampled-data systems*, International Journal of Systems Science, vol. 32, 2001,pp-889-898.
  60. Sing Kiong Nguang, *Comments on "Robust stabilization of uncertain input-delay systems by sliding mode control with delay compensation"*, Automatica, vol 37, 2001, pp 1677
  61. Sing Kiong Nguang, *Zero dynamics approach to robust stabilisation for a class of structural nonlinear systems*, Systems Analysis Modelling simulation, vol. 41, no. 2, pp. 199-222, 2001
  62. Sing Kiong Nguang and Minyue Fu, *Robust stabilisation for a class of nonlinear systems via output feedback*, International Journal of Systems Science, Vol. 33, pp585-597, 2002
  63. Sing Kiong Nguang and Peng Shi,  *$H_\infty$  control of fuzzy systems models using linear output controllers*, Systems Analysis Modelling Simulation, Vol. 42, pp 1439-1453, 2002
  64. Shaosheng Zhou, Gang Feng, Nguang, S.K. *Comments on "Robust stabilization of a class time-delay nonlinear systems"*, IEEE Trans. on Automatic Control, Vol. 47 pp1586–1586, 2002.
  65. El Kebir Boukas, Peng Shi and Sing Kiong Nguang, *Robust  $H_\infty$  Control for Linear Markovian Jump Systems with Unknown Nonlinearities*, Journal of Mathematical Analysis and Applications, 241-255, 2003
  66. Peng Shi, El Kebir Boukas, Sing Kiong Nguang and Xianping Guo, *Robust disturbance attenuation for discrete-time active fault tolerant control systems with uncertainties*, Optimal Control Applications & Methods, 24, pp.85-101, 2003
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67. Sing Kiong Nguang and Shi Peng, *Robust Nonlinear  $H_\infty$  Control of Sampled-Data Systems*, Systems Analysis Modelling Simulation, pp. 101-110, 2005
68. Peng Shi, Magdi Mahmoud, Sing Kiong Nguang and Abdulla Ismail, *Robust filtering for jumping systems with mode-dependent delays*, Signal Processing, pp. 140-152, 2006.
69. A K Swain, E.M.A.M Mendes and S.K. Nguang, *Analysis of the effects of time delay in nonlinear systems using generalized frequency response functions*, Journal of Sound and Vibration, 294, pp. 341-354, 2006
70. Zhenting Hou, Jiaowan Luo, Peng Shi and Sing Kiong Nguang, *Stochastic stability of Ito stochastic differential equations with semi-Markovian jump parameter*, IEEE Trans. on Automat. Contr., 51, 8, pp. 1383-1387, 2006.
71. Sing Kiong Nguang and Shi Peng, *Nonlinear H-infinity Control of Uncertain Sampled-Data Systems*, International Journal of Systems Science, 37,15, 1039-1050, 2006
72. Sing Kiong Nguang, Shakir Md Saat and Matthias Krug, *Static Output Feedback Controller Design for Uncertain Polynomial Systems: An Iterative Sums of Squares Approach*, IET Control Theory & Appl., 5, 9, 1079-1084, 2011.
73. Shakir Saat, Dan Huang, and Sing Kiong Nguang, *Robust state feedback control of uncertain polynomial discrete-time systems: An integral action approach*, Int. J. of Innovative Computing Information and Control, accepted 2012.
74. Matthias Krug, Shakir Saat and Sing Kiong Nguang, *Robust H-infinity Static Output Feedback Controller Design for Parameter Dependent Polynomial Systems: An Iterative Sums of Squares Approach*, Journal of the Franklin Institute, accepted 2012.
75. S Saat, D Huang, S.K Nguang, AH Hamidon, *Nonlinear state feedback control for a class of polynomial nonlinear discrete-time systems with norm-bounded uncertainties: An integrator approach*, Journal of the Franklin Institute, accepted 2013
76. Jiwei Wen, Fei Liu and Sing Kiong Nguang, *Finite time H-infinity control for discrete-time Markovian jump systems subject to average dwell time*, Transaction of the Institute of Measurement and Control, accepted 2013.
77. Shakir Saat, Sing Kiong Nguang and Chih-Min Lin, *Robust nonlinear H-infinity state feedback control of polynomial discrete-time systems: An integrator Approach*, Circuit Systems Signal Processing, accepted 2013.
78. Shakiie Saat and Sing Kiong Nguang, *Nonlinear H-infinity Output Feedback Control with integrators for polynomial discrete time systems*, International Journal of Robust and Nonlinear control, accepted 2013.
79. Wenqin Wang and Sing Kiong Nguang, *Robust delay-probability-distribution-dependent stability of uncertain genetic regulatory networks with time-varying delays*, Neurocomputing, accepted 2013
80. Wenqin Wang and Sing Kiong Nguang, *Novel Delay-dependent Stability criterion for uncertain genetic regulatory networks with interval time varying delays*, Neurocomputing, accepted 2013
81. Jiwei Wen and Sing Kiong Nguang, *Asynchronous H-infinity Control of Constrained Markovian Jump Linear Systems with Average Dwell Time*, International Journal of Sensors, Wireless, Communications and Control, accepted 2013.
82. A Nasiri, Sing Kiong Nguang, A Swain, *Adaptive sliding mode control for a class of MIMO nonlinear systems with uncertainties*, Journal of the Franklin Institute, accepted 2013

### **Biotechnology and Biochemical**

83. Sing Kiong Nguang and Xiao Dong Chen, *Simple substrate feeding rate control mechanism for optimising the steady state productivity of a Class of Fermentation Processes*, Biotechnology Progress, Vol 13, 1997, pp 200-204.
  84. Xiao Dong Chen, Zheng Dong Chen, Sing Kiong Nguang and Skelte Anema, *Exploring the reaction kinetics of whey protein denaturation/aggregation by assuming the denaturation step is reversible*, Biochemical Engineering Journal 2, 1998, pp 63-69.
  85. Sing Kiong Nguang and Xiao Dong Chen, *Recursive Least Squares Scheme for Operating a Class of Continuous Fermentation Processes at the Optimal Steady State Productivity*, Journal of Chem. Technology and Biotechnology, 1998, pp 227-232.
  86. Sing Kiong Nguang and Xiao Dong Chen, *High Frequency Multi Input Periodic operation of continuous fermentation process*, Journal of Chem. Technology and Biotechnology, 1998, pp
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87. Sing Kiong Nguang and Xiao Dong Chen, *Simple procedure for operating a class of continuous fermentation processes at the optimal productivity*, Biochemical Engineering Journal 1, 1998, pp131-136.
88. Sing Kiong Nguang and Xiao Dong Chen, *Robust  $H_{\infty}$  control of a Class of Continuous Fermentation Processes at the Optimal Steady State Productivity*, Applied Mathematics Letters, 1999, pp 61-69.
89. Sing Kiong Nguang and Xiao Dong Chen, *Optimal control of a class of continuous fermentation processes under input constraints*, Systems Analysis Modelling and Simulation, Vol. 36, 1999, pp63-76.
90. Sing Kiong Nguang and Xiao Dong Chen, *Extremum seeking control for a class of continuous fermentation processes*, Bioprocess Engineering, Vol. 23, pp 417-420, 2000
91. Stefan Borg, Sing Kiong Nguang and Xiao Dong Chen, *Nonlinear  $H_{\infty}$  control of polymerisation reactors*, ISA Transactions, Vol. 40, 2001 pp 73-84
92. Sing Kiong Nguang, LeiZhi Chen and Xiao Dong Chen, *Optimisation of fed-batch culture of Hybridoma cells using genetic algorithm*, ISA Transactions, 40 (4):381-389, 2001.
93. Sing Kiong Nguang and Xiao Dong Chen, *Control of Continuous Fermenters under input constraints*, International Journal of Systems Science, Vol. 32, pp 313-320, 2001
94. Xiao Dong Chen, X. Y Xu, Sing Kiong Nguang and A. E Bergles, *Characterization of the effect of corrugation angles on hydrodynamic and heat transfer performance of four-start spiral tubes*, Journal of Heat Transfer, vol. 123, 2001, pp. 1149-1158
95. Yiu, Chen and Sing Kiong Nguang, *Backstepping control for a class of power systems*, Systems Analysis Modelling simulation, Vol. 42, pp 825 – 849, 2002
96. LeiZhi Chen, Sing Kiong Nguang, and Xiao Dong Chen, *On-line identification and optimisation of feed rate profiles for high productivity fed-batch culture of Hybridoma cells using genetic algorithm*, ISA Transactions 41, pp. 409-419, 2002.
97. Sing Kiong Nguang and Xiao Dong Chen, *Robust stabilization of binary distillation columns with input constraints*, International Journal of Systems Science, 33(9):759-765, 2002
98. Xiao Dong Chen and Sing Kiong Nguang, *The Theoretical Basis of Heat Flux Sensor 'Pen'*, The Journal of Applied Mathematics and Decision Sciences, pp 1-10, 2003.
99. LeiZhi Chen, Sing Kiong Nguang, Xue Mei Lin and Xiao Dong Chen, *Soft Sensors development for on line biomass estimation*, Bioprocess and Biosystems Engineering, 26, pp. 191-195, 2004
100. LeiZhi Chen, Sing Kiong Nguang, Xue Mei Lin and Xiao Dong Chen, *Modelling and Optimization of fed-batch fermentation processes using dynamic neural networks and genetic algorithms*, Biochemical Engineering Journal, 22,51-62, 2004
101. Yoo, J., Chen, X.D., Nguang, S.K., *A Simple Mathematical Model of Batch Growth of Bacillus stearothermophilus in Various Dairy Fluids*, Developments in Chemical Engineering and Mineral Processing- An Australasian Research Journal (special issue on food and bioprocessing), 13, 31-41, 2005
102. He, M., Li. X.M., Qin, G.F., Nguang, S.K., and Chen, X.D, *Cost-Effective optical sensor for online measurement of biomass* Developments in Chemical Engineering and Mineral Processing- An Australasian Research Journal (special issue on food and bioprocessing), 13, 63-70, 2005
103. Kuek Tze Lee, Mohammed Farid and Sing Kiong Nguang *The Mathematical Modelling of the Rehydration Characteristics of Fruits*, Journal of Food Engineering, 72, 16-23, 2006
104. Ta-Yuan Wang and Sing Kiong Nguang, *Low Cost Sensor for Volume and Surface Area Computation of Axi-symmetric Agricultural Products*, Journal of Food Engineering, 70,3, 870-877, 2007

## Biomedical

105. Simon C. Malpas, Todd A. Hore, Michael Navakatykyan, Elena V. Lukoshkova, Sing Kiong Nguang & Paul Austin, *Resonance in the renal vasculature evoked by activation of the sympathetic nerves*, American Journal of Physiology - Regulatory Integrative & Comparative Physiology, 1999, 45(5): R1311-R1319.
  106. Raymond M. W. Cheung, Sing Kiong Nguang and Simon C. Malpas, *Neural Network Modelling of the Dynamic Relationship Between Arterial Pressure, Sympathetic Nerve Activity and Renal Blood Flow in Conscious Rabbits*, Systems Analysis Modelling simulation, vol. 40, pp.
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107. Liu H, Guild S, Ringwood JV, Barrett CJ, Leonard BL, Nguang SK, Navakatikyan MA and Malpas SC. *The dynamic baroreflex control of blood pressure; influence of the heart vs. peripheral resistance*, American Journal of Physiology- Regulatory Integrative & Comparative Physiology, R533-R542, 2002
108. Sarah-Jane Guild, S.C. Malpas, G.A. Eppel, S. K. Nguang and R.G Evans, *Influence of renal perfusion pressure on responses of intrarenal blood flow to renal nerve stimulation in rabbits*, Clinical and Experimental Pharmacology and Physiology, 31 (1-2), pp. 35-45, 2004.

#### **Bit-Stream Implementation**

109. Nitish Patel and Sing Kiong Nguang, *An Alternative Approach for Real Time Digital Controller Implementation*, WSEAS Transactions on Systems, pp. 2938-2944, 2004
110. Nitish Patel and Sing Kiong Nguang, *Real Time Digital Controller Implementation Using Deterministic Uniformly Weighted Bit Streams*, International Journal of Innovative Computing information and control, 2, pp. 505-517, 2006
111. Nitish Patel and Sing Kiong Nguang and George Coghill, *Neural Network Implementation, Using Bit-Streams* IEEE Transactions on Neural Networks, Vol. 18, 5, pp.1488-1504,2007

#### **Networked Control systems:**

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#### Current Major Research Grants / Funding:

- Title: **High Efficiency Organic PV**; Agency: ORI, FRST. Amount: 6 million (6 years). (Key Researcher) 2009 – 2015  
**Abstract:** *The world is facing a major challenge in meeting the growing demand for energy, and securing an affordable energy solution that does not compromise our environmental responsibilities. This bid is aimed toward answering that challenge, and by 2016 aspires to produce an all-plastic, recyclable, high efficiency photovoltaic (PV) cell that can be incorporated into a roofing product (Intelliroof®), which is capable of providing the total average energy requirements for a household. The beneficiaries will in the first instance be New Zealanders, with access to cheaper, cleaner energy, and an assurance of supply. It will also have significant impact on reducing the effects on the environment associated with generation and transmission of the grid-tied energy solutions. In the longer term, it will play a significant role in meeting a very real global need for clean, sustainable energy, which is not produced at the cost of our environment.*
- Title: **High Performance Sensors**; Agency: High-Value Manufacturing and Services Research Fund, MBIE, NZ. Amount: 9 million (4 years). (key Researcher) 2012-2016.  
**Abstract:** *This bid supports the development of high tech manufacturing in NZ in the form of a*

*new sensing platform technology, and its application to address issues in the Dairy and Aquaculture Industries. The bid brings together scientific and engineering teams from CRIs, Academia and Industry with expertise in manufacturing, sensor development and decades of funded research into the understanding of production, disease and hygiene related to the chosen application areas.*

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