Wai-Ki Ching

Curriculum Vitae

Mailing Address:	Department of Mathematics, University of Hong Kong, Pokfulam Road, Hong Kong, China.
Telephone:	Office: (+852)-2859-2256 Fax: (+852)-2559-2225.
Email:	wching@hku.hk
Present Position:	Professor.
Research Interests:	Stochastic Modelling and Matrix Computations: Computational Biology, Computational Management Science and Numerical Linear Algebra with Applications.

Education Background

1981–1988 F.1 – F.7, St. Paul's College, Hong Kong, China.

1988–1991 B. Sc. (Hons.), University of Hong Kong, Hong Kong, China.

1991–1994 M.Phil. in Applied Mathematics, University of Hong Kong, Hong Kong, China.

Thesis Title: *Construction of Preconditioners for Queueing Networks.*
M.Phil. advisor: Prof. Raymond H. Chan.

1994–1998 Ph.D. in Systems Engineering and Engineering Management, Chinese University of Hong Kong, Hong Kong, China.
Thesis Title: *Iterative Methods and Analytical Models for Queueing and Manufacturing Systems.*
(Awarded the Outstanding Ph.D. Thesis Prize).
PhD advisor: Prof. Xun-Yu Zhou.

2000–2001 Postgraduate Certificate in Academic Practice
(A postgraduate qualification for tertiary education in U.K.).
University of Southampton.

Working Experience

09/1995–07/1997	Demonstrator (Full-time), Department of Applied Mathematics, Hong Kong Polytechnic University, Hong Kong, China.
08/1997–07/1998	Demonstrator (Full-time), Department of Mathematics, HKUST.
08/1998–08/1999	Statistician, The Hong Kong SAR Government, Hong Kong.
09/1999–08/2000	Croucher Foundation Post-doctoral Fellow, Institute of Management Studies, University of Cambridge, Cambridge, England.
09/2000–08/2001	Lecturer, Faculty of Mathematical Studies, University of Southampton, England.
09/2001–08/2008	Lecturer (Assistant Professor), Department of Mathematics, HKU.
09/2005–08/2008	Deputy Head, Department of Mathematics, HKU.
09/2008–06/2014	Associate Professor, Department of Mathematics, HKU.
09/2011–08/2014	Deputy Head, Department of Mathematics, HKU.
	Successfully designed and launched two minors:
	-Minor in Computational and Financial Mathematics.
	-Minor in Operational Research and Mathematical Programming.
	Successfully launched two Engineering Mathematics courses:
	-MATH1851 Calculus and Ordinary Differential Equations
	-MATH1853 Linear Algebra, Probability and Statistics
07/2014–present	Professor, Department of Mathematics, HKU.
09/2014–05/2017	Head, Department of Mathematics, HKU.
	(The Department Ranked 9th in Best Global Universities for Mathematics by U.S. News, 2014)
	`https://hkumath.hku.hk/MathWWW/news/2014/HKUMATHranks_20141111.html`
	(The Department Ranked 20th in QS World University Rankings by Subject, 2015).
	`https://hkumath.hku.hk/MathWWW/news/2015/HKUMATHranks_20150430.html`
09/2017–08/2019	RAE 2020 Champion, Department of Mathematics, HKU.
	(The departments, MATHS and SAAS ranked No. 1 in overall 4* performance in Mathematics and Statistics Panel).
	`https://www.ugc.edu.hk/doc/eng/ugc/rae/2020/result/rae2020results03.pdf`

Publications (Partial)

1. R. Chan and **W. Ching**, *Toeplitz-circulant Preconditioners for Toeplitz Systems and Their Applications to Queueing Networks with Batch Arrivals*, SIAM Journal on Scientific Computing, 17 (1996) 762–772.

2. **W. Ching**, R. Chan and X. Zhou, *Circulant Preconditioners for Markov Modulated Poisson Processes and Their Applications to Manufacturing Systems*, SIAM Journal on Matrix Analysis and Applications, 18 (1997) 464–481.

3. F. Lin and M. Ng and **W. Ching**, *Factorized Banded Inverse Preconditioners for Matrices with Toeplitz Structure*, SIAM Journal on Scientific Computing, 26 (2005) 1852–1870.

4. T. Akutsu, M. Hayasida, **W. Ching** and M. Ng, *Control of Boolean Networks: Hardness Results and Algorithms for Tree Structured Networks*, Journal of Theoretical Biology, 244 (2007) 670–679.

5. **W. Ching**, S. Zhang, M. Ng and T. Akutsu, *An Approximation Method for Solving the Steady-state Probability Distribution of Probabilistic Boolean Networks*, Bioinformatics, 23 (2007) 1511–1518.

6. **W. Ching**, M. Ng and Y. Wen, *Block Diagonal and Schur Complement Preconditioners for Block-Toeplitz Systems with Small Size Blocks*, SIAM Journal on Matrix Analysis and Applications, 29 (2007) 1101–1119.

7. Y. Wen, M. Ng and **W. Ching**, *Iterative Algorithms Based on Decoupling of Deblurring and Denoising for Image Restoration*, SIAM Journal on Scientific Computing, 30 (2008) 2655–2675.

8. X. Huang, J. Gu, **W. Ching** and T. Siu, *Impact of Secondary Market on Consumer Return Policies and Supply Chain Coordination*, Omega, The International Journal of Management Science, 45 (2014) 57–70.

9. D. Zhu, Y. Xie, **W. Ching** and T. Siu, *Optimal Portfolios with Maximum Value-at-Risk Constraint under a Hidden Markovian Regime-switching Model*, Automatica, 74 (2016) 194–205.

10. X. Cheng, T. Tamura, **W. Ching**, T. Akutsu, *Discrimination of Singleton and Periodic Attractors in Boolean Networks*, Automatica, 84 (2017) 205–213.

11. A. Melkman, X. Cheng, **W. Ching**, T. Akutsu, *Identifying a Probabilistic Boolean Threshold Network from Samples*, IEEE Transactions on Neural Networks and Learning Systems, 29 (2018) 869–881.

12. S. Guo, J. Gu and **W. Ching**, *Adaptive Online Portfolio Selection with Transaction Costs*, European Journal of Operational Research, 295 (2021) 1074–1086.

13. L. Sun, **W. Ching** and J. Lu, *Stabilization of Aperiodic Sampled-data Boolean Control Networks: A Delay Approach*, IEEE Transaction on Automatic Control, 66 (2021) 5606–5611.

14. X. Cheng, **W. Ching**, S. Guo and T. Akutsu, *Discrimination of Attractors with Noisy Nodes in Boolean Networks*, Automatica, 130 (2021) 109630.

15. L. Sun and **W. Ching**, *Stabilization and Reconstruction of Sampled-data Boolean Control Networks under Noisy Sampling Interval*, IEEE Transactions on Automatic Control, 68 (2023) 2444–2451.

16. A. Melkman, S. Guo, **W. Ching**, P. Liu, T. Akutsu, *On the Compressive Power of Boolean Threshold Autoencoders*, IEEE Transactions on Neural Networks and Learning Systems, 34 (2023) 921–931.

17. S. Guo, J. Gu, C. Fok and **W. Ching**, *Online Portfolio Selection with State-dependent Price Estimators and Transaction Costs*, European Journal of Operational Research, 311 (2023) 333–353.

18. G. Xiao, Z. Bai and **W. Ching**, *A Row-Wise Update Algorithm for Sparse Stochastic Matrix Factorization*, SIAM Journal on Matrix Analysis and Applications, 43 (2022), 1712-–1735.

19. L Li, L. Sun, G. Chen, C. Wong, **W. Ching** and Z. Liu, *LogBTF: Gene Regulatory Network Inference Using Boolean Threshold Network Model from Single-cell Gene Expression Data*, Bioinformatics 39 (2023) doi.org/10.1093/bioinformatics/btad256.

20. H. Jiang, S. Zhan, **W. Ching** and L. Chen, *Robust Joint Clustering of Multi-omics Single-cell Data via Multi-modal High-order Neighborhood Laplacian Matrix Optimization*, Bioinformatics, 39 (2023) doi.org/10.1093/bioinformatics/btad414.

Research Grants (Partial)

1. *On Correlated Default Processes for Financial Credit Risk in an Incomplete Information Market*
   Principal Investigator.
   Project Account: (RGC GRF Grant No. 17301214, 1 September 2014)
   Amount: 439,150 HK Dollars.

2. *Flexible Nursing Staff Demand Modelling for Nursing Homes*
   Principal Investigator.
   Project Account: (RGC GRF No. 15210815, 1 Jan., 2016 - 31 December 2018)
   Amount: 329,061 HK Dollars.

3. *Identifying Probabilistic Boolean Network Structures with Small Sample Sizes and Stability Analysis*
   Principal Investigator.
   Project Account: (RGC GRF No. 17301519, 1 Aug., 2019 - 31 July 2023)
   Amount: 332,261 HK Dollars.

4. *Online Portfolio Selection: Models and Algorithms*
   Principal Investigator.
   Project Account: (RGC GRF No. 17309522, 1 Aug., 2022 - 31 July 2025)
   Amount: 764,250 HK Dollars.

5. *Theoretical and Numerical Analysis for the Higher-order Multivariate Markov Chain Models and Their Nonnegative Tensor Models*
   Co-Investigator (With W. Li).
   Project Account: National Natural Science Foundation of China (NSF 11271144, China, Jan. 2013 - Dec. 2016)
   Amount: 600,000 RMB.

6. *The Theory and Numerical Analysis for Nonnegative Tensors and their Models in Data Analysis*
   Co-investigator (With W. Li).
   (NSF No. 11671158, China, Jan. 2017 - Dec. 2020)
   Amount: 480,000 RMB.

7. *Optimal Integration Modeling and Heterogeneity Analysis of Single Cell Multi-omics Data*
   Co-investigator (With H. Jiang).
   (NSF No. 12271522, China, Jan. 2023 - Dec. 2026)
   Amount: 450,000 RMB.

8. *A Research Study on Mixed Precision Algorithm of Matrix Eigenvalue Decomposition and Tensor Decomposition*
   Co-investigator (With Z. Bai).
   (NSF No. 12371382, China, Jan. 2024 - Dec. 2027)
   Amount: 435,000RMB

Awards and Honors

1998	Award of the Outstanding Ph.D. Thesis Prize in the Engineering Faculty, the Chinese University of Hong Kong, China.
1998	Award of Croucher Foundation Fellowship, Hong Kong, China.
1998	Award of the Best Student Paper Prize in the Copper Mountain Conference (Colorado University and SIAM) U.S.A.
1998	Award of Certificate of Merit in the IEEE (Hong Kong Section) Postgraduate Student Paper Contest, Hong Kong, China.
2011	Doris Zimmern HKU-Cambridge Hughes Hall Fellowship (2011).
2012	Mathematics - An Octopus awarded the Knowledge Exchange Award for Faculty of Science (2012).
2013	HKU Overseas Fellowship Award.
2014	2013 Higher Education Outstanding Scientific Research Output (Team Member) Awards (Second Prize), the Ministry of Education (MoE) of China, China, 2014.
2017	Distinguished Alumni Award, Faculty of Engineering, The Chinese University of Hong Kong (2017).
2017	Long Service award (15-year), The University of Hong Kong (2017).
2017	Outstanding Reviewer for International Journal of Production Economics (2017).
2018	Outstanding Reviewer for Journal of Economics Dynamics and Control (2018).
2020	2019 Higher Education Outstanding Scientific Research Output (Team Member) Awards (Second Prize), Hunan Province, China, 2020.
2020	The Outstanding Research Student Supervisor Award (ORSSA) 2018-19.
2021	The World's Top 2% Most-cited Scientists by Stanford University.

Public & Community Service

1. Member of Curriculum Development Council (CDC) HKEAA Working Group on New Senior Secondary School Mathematics Curriculum (2005-2006).

2. Member of Curriculum Development Council Committee on Mathematics Education, Education Bureau, HKSAR, (2011-2017).

3. External Examiner of Master of Arts in Mathematics and Pedagogy, The Education University of Hong Kong, (2017-2021).

4. The High-level Advisory Panel of Chief Executive's Award for Teaching Excellence, HKSAR government, (2016, 2021).

5. Member of Public Examinations Board, Hong Kong Examinations and Assessment Authority (HKEAA), 2017-.

6. Member of Standards Committee, Hong Kong Examinations and Assessment Authority (HKEAA), 2017-.

7. Member of Curriculum Development Council (CDC), Education Bureau, HKSAR, 2019-.

8. Member of Standing Committee on STEM Education, Curriculum Development Council (CDC), Education Bureau, HKSAR, 2020-.