

Curriculum Vitae

Peter Chang-Yi Weng

翁章譯

EDUCATION

- Ph.D. in Applied Mathematics, Monash University, Australia, February, 2010- November, 2013. (Title of Thesis: Numerical Solution of Large-Scale Problems in Control System Design)
- M.S. in Applied Mathematics, National Cheng Kung University, Tainan, Taiwan, June 2006. (Title of Thesis: On the Existence of Neimark-Sacker Hopf Bifurcation for a Discrete Predator-Prey Model)
- B.S. in Applied Mathematics, National Chiayi University, Chiayi, Taiwan, June 2004.

EXPERIENCE

Academic

- Associate Professor, Guangdong-Taiwan College of Industrial Science and Technology, Dongguan University of Technology (September 2018-August 2022)
- Postdoctoral Scholar, Institute of Statistical Science, Academia Sinica (March 2014-July 2018)
- Organizer of Postdoctoral Seminar, Institute of Statistical Science, Academia Sinica (August 2017- January 2018)

Teaching

- Support Staff, Monash University, Australia (March 2010-November 2013, for Calculus, Engineering Mathematics and Advanced Engineering Mathematics)
- Internship Teacher, Nan Zih Elementary School, Tainan, Taiwan (September 2006-June 2007)
- Teaching Assistant, National Cheng Kung University (September 2004-June 2006)

Organizer

- Military Service, Mashagou Fish Harbor Inspection Office, Taiwan (July 2007-June 2008)
- Graduate Class Leader, National Cheng Kung University (September 2005-June 2006)
- Class Leader, National Chiayi University (September 2002-June 2003)

PUBLICATIONS

Journal Paper

1. **P.C.-Y. Weng**, Solving large-scale nonsymmetric algebraic Riccati equations from two-dimensional transport models by doubling, *J. Comput. Appl. Math.* (SCI, IF: 2.621) DOI: <https://doi.org/10.1016/j.cam.2021.113447>
2. **P.C.-Y. Weng**, Solving two generalized nonlinear matrix equations. *J. Appl. Math. Comput.*, 66 (2021) 543-559. (SCIE, IF: 1.686)
3. **P.C.-Y. Weng** and F.K.-H. Phoa, Perturbation analysis and condition numbers of rational Riccati Equations, *Ann. Math. Sci. App.*, 6 (2021) 25-49. (corresponding author)
4. **P.C.-Y. Weng**, Perturbation analysis of rational Riccati equations, *Ann. Math. Sci. App.*, 5 (2020) 349-373.
5. **P.C.-Y. Weng** and F.K.-H. Phoa, Perturbation Analysis of Linear Dynamical System, *Adv. Pure Math.*, 10 (2020) 155-173. (corresponding author)
6. **P.C.-Y. Weng** and F.K.-H. Phoa, Calibrating linear continuous-time dynamical systems via perturbation analysis, *Filomat*, 32 (2018) 1909-1915. (corresponding author) (SCI, IF: 0.695)
7. F.K.-H. Phoa, **P.C.-Y. Weng** and Y.S. Chang, A mathematical model on the propagation of node attributes on a social network, *IAENG Transactions on Engineering Sciences*, (2016) 104-117.
8. **P.C.-Y. Weng** and F.K.-H. Phoa, Small-sample statistical condition estimation of large-scale generalized eigenvalue problems, *J. Comput. Appl. Math.*, 298 (2016) 24—39. (corresponding author) (SCI, IF: 1.357)

9. H.Y. Fan, **P.C.-Y. Weng** and E.K.-w. Chu, Numerical solution to generalized Lyapunov, Stein and rational Riccati equations in stochastic control, *Numer. Algor.*, 71 (2016) 245—272. (corresponding author) (SCI, IF: 1.241)
10. E.K.-w. Chu and **P.C.-Y. Weng**, Large-scale discrete-time algebraic Riccati equations- Doubling algorithm and error analysis, *J. Comput. Appl. Math.*, 277 (2015) 115—126. (corresponding author) (SCI, IF: 1.328)
11. H.Y. Fan, **P.C.-Y. Weng** and E.K.-w. Chu, Refining estimates of invariant and deflating subspaces for large and sparse matrices and pencils, *BIT*, 54 (2014)147--169. (corresponding author) (SCI, IF: 0.957)
12. **P.C.-Y. Weng**, E.K.-w. Chu, Y.C. Kuo and W.W. Lin, Solving large-scale nonlinear matrix equations by doubling, *Lin. Alg. Applic.*, 439 (2013) 914--932. (SCI, IF: 0.983)
13. T. Li, **P.C.-Y. Weng**, E.K.-w. Chu and W.W. Lin, Large-scale Stein and Lyapunov equations, Smith method, and applications, *Numer. Algor.*, 63 (2013)727--752. (SCI, IF: 1.005)
14. T. Li, E.K.-w. Chu, W.W. Lin and **P.C.-Y. Weng**, Solving large-scale continuous-time algebraic Riccati equations by doubling, *J. Comput. Appl. Math.*, 237 (2013) 373--383. (SCI, IF: 1.077)
15. **P.C.-Y. Weng**, H.Y. Fan and E.K.-w. Chu, Low-rank approximation to the solution of a nonsymmetric algebraic Riccati equation from transport theory, *Appl. Math. Comp.*, 219 (2012) 729--740. (SCI, IF: 1.349)
16. C.Y. Chiang, E.K.-w. Chu and **C.Y. Weng**, A note on unimodular eigenvalues for palindromic eigenvalue problems, *Int. J. Comp. Math.*, 89 (2012) 2385--2391. (SCI, IF: 0.542)
17. E.K.-w. Chu, C.S. Wang, **C.Y. Weng** and C.C. Yen, Conditioning of state feedback pole assignment problems, *Taiwanese J. Math.*, 16 (2012) 283--304. (SCI, IF:0.67)

SCI 期刊篇數	13 篇
第一作者篇數	9 篇
通訊作者篇數	10 篇

Conference Paper

1. **P.C.-Y. Weng**, F.K.-H. Phoa and Y.S. Chang, A general attribute diffusion mechanism on social networks, Proceedings of the World Congress on Engineering 2015, London, U.K., 1-3 July, 2015.

2. E.K.-w. Chu, T. Li, W.W. Lin and **C.Y. Weng**, A modified Newton's method for rational Riccati equations arising in stochastic control, Proc. IEEE-CCCA 2011, Tunis, Tunisia, 3-5 March, 2011. (DOI: 10.1109/CCCA.2011.6031219)

Revision Paper

1. **P.C.-Y. Weng**, Generalized Smith method for large-scale nonsymmetric algebraic Riccati equations, *J. Sci. Comput.* (Under review)
2. **P.C.-Y. Weng**, A structure-preserving doubling algorithm for the quadratic matrix equation with M-matrix, *J. Appl. Math. Comput.* (Under review)

Preparation Paper

1. **P.C.-Y. Weng** and F.K.-H. Phoa, Singular value decomposition in image denoising and compression.
2. **P.C.-Y. Weng** and F.K.-H. Phoa, Uncertainty quantification on linear dynamical system with ill-conditioned matrices.
3. **P.C.-Y. Weng** and F.K.-H. Phoa, Social exchange theory.
4. **P.C.-Y. Weng**, Model order reduction for parameterized bilinear system.
5. **P.C.-Y. Weng**, Proposed lossy image compression and pattern recognition techniques.
6. **P.C.-Y. Weng**, Transformations between discrete-time and continuous-time stochastic algebraic Riccati equations.
7. **P.C.-Y. Weng**, Solving large-scale generalized discrete-time algebraic Riccati equations by the generalized structure-preserving doubling algorithm.

TEACHING

2018 Courses:

(Fall)

- Calculus (I).

2019 Courses:

(Spring)

- Calculus (II).

2019 Courses:

(Fall)

- Calculus (I).

2020 Courses:

(Spring)

- Calculus (II).

2020 Courses:

(Fall)

- Calculus (I).

2021 Courses:

(Spring)

- Calculus (II).

2021 Courses:

(Fall)

- Calculus (I).

2022 Courses:

(Spring)

- Calculus (II).

- Big Data Analytics and Machine Learning

SUPERVISED STUDENTS

2019 Graduation

- Yanhong Lin- The Intelligent face recognition security system.
- Xinming Liao- Using tensorflow neural network to simulate BCD decoding circuit on Arduino.
- Xinyu Liang- Using tensorflow model to implement IC7447 decoding circuit and to verify on Arduino.
- Henghui Liang- The design of intelligent socket firmware based on MSP430.
- Bangxi Hou- The firmware design of automatic stop control system.

- Yongcheng He- The hardware design of smart plugs and motor health system.
- Tinghui Chen- The software design of automatic stop control system.
- Minchao Chen- An intelligent vehicle platform based on robot operating system and object detection techniques.
- Zhencheng Huang- The software design of the intelligent socket and motor health inspection system.

2020 Graduation

- Xiaoda Xie- The image and text recognition system based on Python.
- Zhifa Wu- The front-end-design of WeChat ordering applet.
- Yezhi Tu- The design of multifunction table lamp bases on Arduino UNO board.
- Zhicong Tan- The implementation of license plate recognition in the unmanned parking lot.
- Xiaopei Qiu- The intelligent rubbish bin based on Arduino.
- Shuning Ma- The handwritten digital recognition drawing board on Python.
- Jiahe Ma- The data analysis system of indoor atmospheric environment based on Swing architecture.
- Songjin Lu- The simulation of indoor fire monitor system associated with image recognition.
- Junyuan Liu- The clothing matching system.
- Ruilong Lin- The study of the sleep respiratory monitor system based on PVDF.
- Qin Liang- The smart cup.

2021 Graduation

- Xiangyu Chen- The image recognition of brand logo based on deep learning.
- Kaming Cheung- The study of the algorithm of wavelet threshold denoising in the image processing.
- Shouye Feng- The door access system of face recognition based on raspberry pie.
- Yiungai Tam- The application of fire protection system.
- Keling Chen- Three dimension design and rapid prototyping of the fanner vane based on IMU.
- Haoxin Wei- The animal image recognition based on CNN.
- Kaho Au- The monitor system of the agricultural wireless network based on Arduino.

2022 Graduation

- Peinan Ye- The temperature and humidity system based on the single chip microcomputer.
- Peiyong Chen- The design of sound level meter based on STM32.
- Quanmin Wu- The intelligent drying rack based on 51 single chip microcomputer.
- Hongyi Gou- The analysis of house price (population flow) analysis based on Python web crawler.
- Xiaotong Hu- The lighting lamp with intelligent greenhouse timing and temperature control based on 51 single chip microcomputer.
- Risheng Xiong- The automatic character recognition system based on MATLAB.
- Haoxing Liang- Smart trash can—Self-regulating humidity and temperature.
- Weiran Chen- The indoor ceiling robot with self-identification fire.
- Hongshen Long- The design of temperature and smoke fire alarm based on 52 single chip microcomputer.

Award

- Associate Professor of Dongguan University of Technology (2018-2022)
- Distinguished Paper Award of 2018 the International Consortium of Chinese Mathematicians Best Paper Award.
- Postdoctoral Scholar of Academia Sinica (2016-2018)
- Best Paper Award of the 2015 International Conference of Computational Statistics and Data Engineering (July 2015)
- Ministry of Science and Technology (Taiwan) grant number (2014-2015)
- Faculty of Science Postgraduate Publications Award (2013)
- Monash Residential Services Higher Degree Research Merit Scholarship (2011-2012)
- Monash Graduate Scholarship (2010-2013)
- Monash International Postgraduate Research Scholarship (2010-2013)
- Cheng Kung Cultural Foundation Scholarship (2004-2006)

Presentations

Invited Talks

1. International Statistical Symposium CSA-KSS-JSS Special Invited Sessions, National Chiao Tung University, Taiwan, 2014.
2. Sunbelt XXXV International Sunbelt Social Network Conference, Hilton Metropole, Brighton, UK, 2015.
3. Uniform Convergence of Sequences of Functions, National University of Tainan, Taiwan, 2015. -Job interview
4. Condition Estimation of Large-Scale Problems in Control System Design, National Chung Hsing University, Taiwan, 2015. -Job interview
5. Calculus Teaching, National Chiayi University, Taiwan, 2015. -Job interview
6. Calculus Teaching, Tunghai University, Taiwan, 2016. -Job interview
7. A General Attribute Diffusion Mechanism on Social Networks, National Sun Yat-sen University, Taiwan, 2016.
8. Research and Teaching, Kaohsiung Medical University, Taiwan, 2016. -Job interview
9. 2016 CSA & NCCU Joint Statistical Meetings, National Chengchi University, Taiwan, 2016.
10. Perturbation Analysis of Rational Riccati Equations, Tamkang University, Taiwan, 2017. -Job interview
11. Uncertainty Quantification on Linear Dynamical System, National University of Kaohsiung, Taiwan, 2017.
12. Research and Teaching, Feng Chia University, Taiwan, 2017. -Job interview
13. 5th TWSIAM Annual Meeting, National Chengchi University, Taiwan, 2017.
14. Calculus Teaching, National Taiwan University of Science and Technology, Taiwan, 2017. -Job interview
15. The 3rd International Conference on Fuzzy Systems and Data Mining, National Dong Hwa University, Taiwan, 2017.
16. 2018 South Taiwan Workshop on Computational Mathematics and Analysis Applications, National Cheng Kung University, Taiwan, 2018.
17. Solving Two Generalized Nonlinear Matrix Equations, Soochow University, Taiwan, 2018. -Job interview
18. Calculus Teaching, National Chin-Yi University of Technology, Taiwan, 2018. - Job interview
19. Solving Two Generalized Nonlinear Matrix Equations, Tunghai University, Taiwan, 2018. -Job interview
20. The 27th South Taiwan Statistics Conference, National Cheng Kung University, Taiwan, 2018.
21. Generalized Smith Method for Large-Scale Nonsymmetric Algebraic Riccati Equations, Fu Jen Catholic University, Taiwan, 2022. -Job interview

22. Generalized Smith Method for Large-Scale Nonsymmetric Algebraic Riccati Equations, Chung Yuan Christian University, Taiwan, 2022. -Job interview

Contributed Talks

1. Mathematical Conference and Annual Meeting of the Taiwan Mathematical Society, Chung Yuan Christian University, Taiwan, 2011.
2. Applied Mathematics Conference, National Center for Theoretical Sciences, Taiwan, 2011.
3. SIAM Conference on Applied Linear Algebra, Valencia, Spain, 2012.
4. The 19th International Linear Algebra Society Conference, Seoul, Korea, 2014.
5. A General Attribute Diffusion Mechanism on Social Networks, Institute of Statistical Science, Academia Sinica, Taiwan, 2015.
6. The Annual Meeting of the Taiwanese Mathematical Society, National University of Kaohsiung, Taiwan, 2015.
7. The 11th East Asia SIAM Conference, Macao, China, 2016.
8. The 12th East Asia SIAM Conference, Seoul, Korea, 2017.
9. The Annual Meeting of the Taiwanese Mathematical Society, National Chiayi University, Taiwan, 2017.
10. SIAM Conference on Applied Linear Algebra, Hong Kong Baptist University, Hong Kong, 2018.
11. The 13th East Asia SIAM Conference, Tokyo, Japan, 2018.

Departmental Talks

1. A General Attribute Diffusion Mechanism on Social Networks, Institute of Statistical Science, Academia Sinica, Taiwan, 2014.
2. ISI-ISM-ISSAS Joint Conference 2016, Institute of Statistical Science, Academia Sinica, Taiwan, 2016.

Journal Reviewer

Numerical Algorithms. Linear and Multilinear Algebra. Bulletin of the Iranian Mathematical Society. Electronic Research Archive.

Research Field

Control System Design in Large-Scale Problems, Perturbation Analysis, Matrix Computation, Social Network, Uncertainty Quantification, Model Order Reduction, Image Processing, Pattern Recognition, Artificial Intelligence, Machine Learning, Data Science.

SKILLS

- Mathematics: Calculus, Linear Algebra, Numerical Analysis, Differential Equations, Statistics, Probability Theory, Statistical Computing, Social Network, Uncertainty Quantification, Model Order Reduction, Image Processing, Pattern Recognition.
- Programming: Matlab, C, Visual Basic, Maple.
- Applications: Word, Excel, PowerPoint, LaTeX.

REFEREES

Research Fellow Frederick Kin Hing Phoa

Institute of Statistical Science, Academia Sinica

TEL: 886-2-27835611, Email: fredphoa@stat.sinica.edu.tw

Professor Eric King-wah Chu

School of Mathematical Sciences, Monash University

TEL: 61-3-99054480, Email: Eric.Chu@monash.edu

Professor Chern-Shuh Wang

Department of Mathematics, National Cheng Kung University

TEL: 886-6-2757575, Email: chenshu@mail.ncku.edu.tw