I-Ping Tu

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Personal Statement

My research has mainly focused on developing statistical methods to analyze cryo-electron microscopy (cryo-EM) image data. In recent years, technical breakthrough has transformed cryo-EM to become a main tool for determination of molecular structure to atomic resolution without crystals or in solution. However, the process of structural determination from single-particle cryo-EM images is still very challenging because it involves processing extremely noisy images of unknown orientation. We have developed a 2D classification package called RE2DC with a processing platform ASCEP which integrate RE2DC with other packages to execute a pipeline for 3D structure determinations of cryo-EM data. We will continue developing efficient and robust statistical methods to improve the analysis.

In my view, statistics has played an important role in advancing modern science. Please see my lecture (2022.10.29) "data vs science".

Research Areas

Clustering Analysis, Dimension Reduction, Scan Statistics, Statistical Machine learning, cryo-EM Image Analysis, Block Chain.

Education

9/92--6/97	**Ph.D. in Statistics**, Stanford University
9/89--6/91	**M.S. in Physics**, National Taiwan University
9/85--6/89	**B.S. in Physics**, National Taiwan University

Professional Experiences

May. 2013~present	Research Fellow, The Institute of Statistical Science, Academia Sinica
Aug. 2017~Jul. 2024	Professor, The Data Science Program of National Taiwan University and Academia Sinica
Jul. 2017~Jun. 2021	Deputy Director, The Institute of Statistical Science, Academia Sinica
Aug. 2003~May. 2013	Associate Research Fellow, The Institute of Statistical Science, A.S.
Sep. 2002~Jul. 2003	Senior Statistician, The Stanford Functional Genomics Facility, Stanford University
Mar. 2001~Aug. 2002	Statistician, The Stanford Functional Genomics Facility, Stanford University
Aug. 1997~Jul. 2000	Postdoctoral Fellow, The Department of Health Research and Policy, Stanford University

Honor

2013 Young Scholar Grant Award from Ministry of Science and Technology, Taiwan.

2019 ISI Elected member.

2020 ICCM Best Paper Award (Silver Award).

2021-2025 Principal Investigator Award from Academia Sinica.

Professional Service

2011–2013: Member, Nomination and Election Committee, International Chinese Statistical Association (ICSA)

2016–2018: Executive Council Member, The Chinese Institute of Probability and Statistics

2017–2020: Associate Editor, Statistica Sinica

2017–2019: Member, Program Affairs Council, Data Science Program, National Taiwan University and Academia Sinica

2018–2025: Editorial Board Member, International Statistical Review

2019–2024: Routine Supervisor, The Chinese Institute of Probability and Statistics

2025–2028: Executive Supervisor, The Chinese Institute of Probability and Statistics

2025–2027: Member, Academic Exchange and Cooperation Committee, Academia Sinica

Teaching

Statistics, National Taiwan University, Taiwan, Spring 2009.

Regression Analysis, National Chiao Tung University, Taiwan, Fall 2010.

Statistical and Machine Learning, National Taiwan University, Fall, 2013.

Statistical and Machine Learning, National Taiwan University, Spring, 2016.

Statistics Foundation for Data Science I, National Taiwan University, Fall, 2018, 2019.

Statistics Foundation for Data Science II, National Taiwan University, Spring, 2021, 2022.

Seminar for Data Science, National Taiwan University, Fall, 2020; Fall, 2019; Spring, 2019; Fall, 2018; Spring, 2018; Fall,2017.

Complete Publication List

**refers to the corresponding author.*

Journal Papers

1. Claudia Morais Parada, Ching-Cher Sanders Yan, Cheng-Yu Hung, I-Ping Tu, Chao-Ping Hsu*, Yu-Ling Shih* (2024). “Growth-dependent concentration gradient of the oscillating Min system in Escherichia coli”. *J Cell Biol* (2025) **224**, e202406107. https://doi.org/10.1083/jcb.202406107
2. Hsin-Hung Lin, Chun-Hsiung Wang, Shih-Hsin Huang, Sam Song-Yao Lin, I-Ping Tu, Naoki Hosogi, Chihong Song, Kazuyoshi Murata, Chi-Huey Wong*, Tsui-Ling Hsu*, Wei-Hau Chang* (2024).

"Use of phase plate cryo-EM reveals conformation diversity of therapeutic IgG with 50 kDa Fab fragment resolved below 6 Å". *Scientific Reports* **14**, 14079.

3. Shih-Chi Luo, Min-Chi Yeh, Yu-Hsiang Lien, Hsin-Yi Yeh, Huei-Lun Siao, I-Ping Tu, Peter Chi and Meng-Chiao Ho* (2023). "A RAD51–ADP double filament structure unveils the mechanism of filament dynamics in homologous recombination". *Nature Communications* **14**, 4993 (2023). https://doi.org/10.1038/s41467-023-40672-5
4. Tze Leung Lai, Shao-Hsuan Wang, Szu-Chi Chung, Wei-hau Chang, and I-Ping Tu* (2023). "Uncertainty quantification in dynamic image reconstruction with applications to cryo-EM''. *Statistica Sinica* **33** (2023), 1771-1788. https://doi:10.5705/ss.202021.0419
5. Szu-Chi Chung, Hsin-Hung Lin, Kuen-Phon Wu, Ting-Li Chen, Wei-Hau Chang*, and I-Ping Tu* (2022). "RE2DC: A robust and efficient 2D classifier with visualization for processing massive and heterogeneous cryo-EM data". *bioRxiv*, https://doi.org/10.1101/2022.11.21.517443
6. Wei-hau Chang*, I-Kuen Tsai, Shih-Hsin Huang, Hsin-Hung Lin, Szu-Chi Chung, I-Ping Tu, Steve S.-F. Yu* and Sunney I. Chan* (2021). "Copper centers in the cryo-EM structure of particulate methane monooxygenase reveal the catalytic machinery of methane oxidation". *Journal of American Chemical Society* **143**, 9922-9932. https://doi.org/10.1021/jacs.1c04082
7. Wei-Hau Chang*, Shih-Hsin Huang, Hsin-Hung Lin, Szu-Chi Chung and I-Ping Tu (2021). "Cryo-EM analyses permit visualization of structural polymorphism of biological macromolecules". *Frontiers in Bioinformatics* **1**, 788308. https://doi.org/10.3389/fbinf.2021.788308
8. Shao-Hsuan Wang, Yi-Ching Yao, Wei-Hau Chang and I-Ping Tu* (2021). "Quantification of model bias underlying the phenomenon of Einstein from noise". *Statistica Sinica* **31**, 2355-2379. DOI: 10.5705/ss.202020.0334.
9. Szu-Chi Chung, Shao-Hsuan Wang, Po-Yao Niu, Su-Yun Huang, Wei-Hau Chang and I-Ping Tu* (2020). "Two-stage dimension reduction for noisy high-dimensional images and application to Cryogenic Electron Microscopy". *Annals of Mathematical Sciences and Applications* **5**, 283-316.
10. Szu-Chi Chung, Hsin-Hung Lin, Po-Yao Niu, Shih-Hsin Huang, I-Ping Tu* and Wei-Hau Chang* (2020). "Pre-pro is a fast pre-processor for single-particle cryo-EM by enhancing 2D classification". *Communications Biology* **3**, 508.
11. Ren Chen, I-Ping Tu, Kai-Er Chuang, Qin-Xue Lin, Shih-Wei Liao, Wanjiun Liao* (2020). "Degree of Mining Power Decentralization for Proof-of-Work Based Blockchain Systems". *IEEE Network* **34**, 266-271.
12. I-Ping Tu*, Su-Yun Huang and Dai-Ni Hsieh (2019). "The generalized degrees of freedom of multilinear principal component analysis". *Journal of Multivariate Analysis* **173**, 26-37.
13. Jheng-Syong Wu, Cheng-Yu Hung, Tzu-yun Chen, Sam Song-yao Lin, Shu-Yu Lin, I-Ping Tu, Hung-Ta Chen and Wei-Hau Chang* (2019). "Deriving a sub-nanomolar affinity peptide from TAP to enable smFRET analysis of RNA polymerase II complexes". *Methods* **159-160**, 59-69.
14. Ting-Li Chen, Dai-Ni Hsieh, Hung Hung, I-Ping Tu*, Pei-Shien Wu, Yi-MingWu, Wei-Hau Chang and Su-Yun Huang (2014). "γ-SUP: a clustering algorithm for cryo-electron microscopy". *Annals*

of Applied Statistics **8**, 259-285.

15. Ting-Li Chen, Su-Yun Huang*, Hung Hung and I-Ping Tu (2014). “Introduction to multilinear principal component analysis”. *JCSA* **52**, 24-43.
16. I-Ping Tu*, Shao-Hsuan Wang and Yuan-Fu Huang (2013). “Estimating the Occurrence Rate of DNA Palindromes”. *Annals of Applied Statistics* **7**, 1095-1110.
17. I-Ping Tu (2013). “The Maximum of a Ratchet Scanning Process over a Poisson Random Field”. *Statistica Sinica* **23**, 1541-1551.
18. Hung Hung, Pei-Hsien Wu, I-Ping Tu* and Su-Yun Huang (2012). “On multilinear principal component analysis of order-two tensors”. *Biometrika* **99,** 569-583.
19. Hao-Chih Lee, Bo-Lin Lin, Wei-Hau Chang and I-Ping Tu* (2012). “Towards Automated De-Noising of Single Molecular FRET Data: ADN for smFRET”. *Journal of Biomedical Optics **17***.
20. Hock Peng Chan* and I-Ping Tu (2011). “Log-linear, Logistic Model Fitting and Local Score Statistics for Cluster Detection with Covariate Adjustments”. *Statistics in Medicine* **30**, 91-100.
21. Wei-Hau Chang*, Michael T.-K. Chiu, Chin-Yu Chen, Chi-Fu Yen, Yen-Cheng Lin, Yi-Ping Weng, Ji-Chau Chang, Yi-Min Wu, Holland Cheng, Jianhua Fu, and I-Ping Tu (2010). “Zernike phase plate cryo-electron microscopy facilitates single particle analysis of unstained asymmetric protein complexes”. *Structure* **18**, 17-27.
22. Ying-Ping Chen, Hsin-Cheng Huang, and I-Ping Tu (2010). “A New Approach for Selecting the Number of Factors”. *Computational Statistics and Data Analysi*s **54**, 2990-2998.
23. Hock Peng Chan*, I-Ping Tu and Nancy Zhang (2009). “Boundary crossing probability computations in the analysis of scan statistics” in *Scan Statistics--Theory and Applications*, eds J. Glaz and V. Pozdnyakov and S. Wallenstein, Birkhauser.
24. I-Ping Tu*, Hung Chen and Xin Chen (2009). “An Eigenvector Variability Plot” *Statistica Sinica* **19**, 1741-1754.
25. I-Ping Tu* (2009). “Asymptotic Overshoot for Arithmetic IID Random Variables”, *Statistica Sinica* **19**, 315-323.
26. Suet Yi Leung, Coral Ho, I-Ping Tu, Rui Li, Samuel So, Kent-Man Chu, Siu Tsan Yuen and Xin C hen* (2006). “Comprehensive analysis of 19q12 amplicon in human gastric cancers”. *Modern pathology* **19**, 854-63.
27. I-Ping Tu, Marci Schaner, Maximilian Diehn, Branimir I. Sikic, Patrick O.Brown, David Botstein and Mike Fero* (2004). “A Method for Detecting and Correcting Feature Misidentification on Expression Microarrays”. *BMC Genomics* **6**, 54.
28. Marci E. Schaner , Douglas T. Ross , Giuseppe Ciaravino , Therese Sørlie , Olga Troyanskaya , Maximilian Diehn , Yan C. Wang , George E. Duran , Thomas L. Sikic , Sandra Caldeira , Hanne Skomedal , I-Ping Tu , Tina Hernandez-Boussard , Steven W. Johnson , Peter J. O'Dwyer , Michael J. Fero , Gunnar B. Kristensen , Anne-Lise Børresen-Dale , Trevor Hastie, Robert Tibshirani, Matt van de Rijn , Nelson N. Teng , Teri A. Longacre , David Botstein , Patrick O. Brown , and Branimir I.

Sikic* (2003). Gene Expression Patterns in Ovarian Carcinomas. *Mol. Biol. Cell* **14**, 4376-4386.

29. Suet Ti Leung, Xin Chen, Kent M. Chu, Siu T. Yuen, Jonathan Mathy, Jiafu Ji, Annie S.Y. Chan, Rui Li, Simon Law, Olga G. Troyanskaya, I-Ping Tu, John Wong, Samuel So, David Botstein and Patrick O. Brown* (2002). "Phospholipase A2, Group IIA expression in gastric adenocarcinoma is associated with prolonged survival and less frequent metastasis". *Proc Natl Acad Sc*i **99**, 16203-8.
30. Alice Whittemore*, I-Ping Tu (2000). "Detecting Disease Genes using Family Data. I. Likelihood-base Theory". *American Journal of Human Genetics* **66**, 1328-1340.
31. I-Ping Tu, Balise RR, Alice Whittemore* (2000). "Detecting Disease Genes using Family Data. II. Application to nuclear families". *American Journal of Human Genetics* **66**, 1341-1350.
32. I-Ping Tu and David Siegmund* (1999). "The Maximum of a Function of a Markov Chain and Application to Linkage Analysis" *Advances in Applied Probability* **31**, 510-531.
33. I-Ping Tu and Alice Whittemore* (1999). "Power of Association and Linkage Tests when the Disease Alleles are Unobserved". *American Journal of Human Genetics*, **64**, 641-649.
34. Alice Whittemore* and I-Ping Tu (1998). "Simple Robust Linkage Tests for Affected Sibs". *American Journal of Human Genetics* **62**, 1228-1242.
35. I-Ping Tu (1997). "Theory and Applications of Scan Statistics". *Stanford Technical Report*.
36. R. S. Pruthi, Iain Johnstone and I-Ping Tu, T. A. Stamey* (1997). "Prostate-specific antigen doubling times in patients who have failed radical prostatectomy：Correlation with histologic characteristics of the primary cancer". *Urology* **49**, 737-742.
37. Yi-Chen Cheng* and I-Ping Tu (1992). "Relation between the dielectric function and the density response function for metals with a surface". *Physical Review B* (Condensed Matter) **45**, 1386-1390.

Conference Papers

1. Y. Ku, F. Liu, C. Hsu, M. Chang, S. Hung, I. Tu, W. Chen* (2025). "Optimizing encrypted neural networks: Model design, quantization and fine-tuning using FHEW/TFHE". Proceedings on Privacy Enhancing Technologies Symposium 2025.
2. Szu-Chi Chung, Cheng-Yu Hung, Huei-Lun Siao, Hung-Yi Wu, Wei-Hau Chang, I-Ping Tu* (2021). "Cryo-RALib–a modular library for accelerating alignment in cryo-EM". *IEEE International Conference on Image Processing (ICIP),* 225-229.
3. Szu-Chi Chung, Shao-Hsuan Wang, Cheng-Yu Hung, Wei-Hau Chang, I-Ping Tu* (2021). "rAMI–rapid alignment with moment of inertia for cryo-EM image processing". *Microscopy and Microanalysis* **27**, 3216-3218.
4. Szu-Chi Chung*, Hung-Yi Wu, Wei-Hau Chang, and I-Ping Tu (2021). "Grouping 3D structure conformations using network analysis on 2D cryo-EM projection images". *Focus on Microscopy 2021*.
5. Yu-Jing Lin, Po-Wei Wu, Cheng-Han Hsu, I-Ping Tu and Shih-Wei Liao (2019). "An Evaluation of

Bitcoin Address. Classification based on Transaction History Summarization". In *2019 IEEE International Conference on Blockchain and Cryptocurrency (ICBC)*, 302-310.

6. Chi-Ning Chou, Yu-Jing Lin, I-Ping Tu and Shih-Wei Liao (2018). "Personalized difficulty adjustment for countering the double-spending attack in proof-of-work consensus protocols". In *2018 IEEE International Conference on Internet of Things (iThings) and IEEE Green Computing and Communications (GreenCom) and IEEE Cyber, Physical and Social Computing (CPSCom) and IEEE Smart Data (SmartData),* 1456-1462.

Invited Presentations

1 2004.12, "An Overshoot Correction in a Probability Ratio Test", Conference of Time Series and Sequential Analysis, Academia Sinica, Taiwwan.

2 2005.6, "Asymptotic Overshoots for Arithmetic IID Random Variables", ICSA APPLIED STATISTICS SYMPOSIUM, Washington DC, USA.

3 2005.11, "Beyond the Scree Plot", Workshops on Genomics, National Singapore University, Singapore.

4 2006.7, "Beyond the Scree Plot",『2006 中華機率統計學會年會及學術研討會

5 2007.6, "The Application of Scan Statistics on Genomic Data", Symposium on Recent Development of Statistics in Biological Sciences, NHRI, Taiwan.

6 2007.12, "Asymptotic Overshoots for Arithmetic IID Random Variables", A conference to honor Prof. Huang Den-Yuan, Taiwan.

7 2008.3, "An eigenvector Variability", Workshop for Machine Learning, Taiwan.

8 2008.4, "An eigenvector Variability", Department of Statistics, National Cheng-Chi University, Taiwan.

9 2008.4, "An eigenvector Variability", Department of Mathematics, National Taiwan University, Taiwan.

10 2008.6, "An eigenvector Variability", The ISI-ISM-ISSAS joint meeting Academia Sinica, Taiwan.

11 2008.7, "Overshoots in the Boundary Crossing Problem", International Workshop on Applied Probability, Compiegne, France.

12 2008.12, "The Ratchet Scan Statistics on Poisson Random Field", CASTA, Kyoto, Japan.

13 2009.6, "The Application of Scan Statistics on Genomic Data", ICSA International Conference.

14 2010.10, "Estimate the Occurrence Rate of DNA Palindromes under a Markov Model", Department of Statistics, National Cheng-Chi University, Taiwan.

15 2010.12, "P-value Calculations for Genome-wide Scan Statistics", The Eighth ICSA International Conference.

16 2011.4, "Estimate the Occurrence Rate of the DNA Palindromes", Department of Statistics, National Tsing Hua University, Taiwan.

17 2011.6, "Estimate the Occurrence Rate of the DNA Palindromes", WNAR, CA, USA.

18 2012.4, “A Self Updating Clustering Algorithm γ-SUP Based on γ-Divergence with Application to Cryo-EM Images”, Department of Mathematics, National Taiwan University, Taiwan.

19 2012.5, “A Self Updating Clustering Algorithm γ-SUP Based on γ-Divergence with Application to Cryo-EM Images”, Department of Applied Mathematics, National Sun Yat-sen University, Taiwan.

20 2012.6, “γ-SUP : A Self Updating Clustering Algorithm Based on γ-Divergence with Application to Cryo-EM Images”, Workshop on learning structure high dimensional data, Taida Institute for Mathematical Sciences, Taiwan.

21 2012.6, “γ-SUP : A Self Updating Clustering Algorithm Based on γ-Divergence with Application to Cryo-EM Images”, The 21st South Taiwan Statistics Conference.

22 2012.10, “Application of scan statistics on genomic data: search palindrome clusters”, Taidai Institute of Mathematical Science (TIMS), NTU.

23 2012.11, “The Maximum of a Ratchet Scanning Process over an *r*-dimensional Poisson Random Field with Application in Genomic Sequences”, Institute of Statistics, NCKU.

24 2013.3.13 “Application of Scan Statistics on Genomic Data: Searching Palindrome Clusters”, Institute of Statistics, NUK.

25 2013.3.18, "Scan Statistics over A Poisson Random Field and A Statistical Study on a cryo-EM Image Set", Institute of Statistics, Academia Sinica.

26 2013.5.29, "我的學習經驗及感想", 苗栗縣照南國中, 苗栗縣102年度校外專家暨良師典範支援資優教育方案講座.

27 2013.6.28, “One Learning Experience--about scientific writing”, The 22nd South Taiwan Statistics Conference, NKU.

28 2013.6.29, “Introduction to MPCA”, The 22nd South Taiwan Statistics Conference, NKU.

29 2013.7.2, “Statistical Methods for cryo-EM Image Analysis”, Workshop on Contemporary Statistics, TIMS, NTU.

30 2013.8.6, “On Multi-linear Principal Component Analysis MPCA”, JSM, Montreal, Canada.

31 2013.12.23, “Introduction to multilinear principal component analysis”, ICSA, Hong Kong.

32 2014.3.19, “One Learning Experience--about scientific writing”, Institute of Statistics, Academia Sinica.

33 2014.6.1 “Statistical Analysis for cryo-Electron Microscopy Images”, TWSIAM, NDHU.

34 2014.7.2 “Statistical Analysis for cryo-Electron Microscopy Images”, IMS APRM, Taipei.

35 2015.4.3 “A Structure Principal Component Analysis for cryo-Electron Microscopy Images” Three Institute Joint Meeting (ISI,ISM and ISSAS), Tokyo. Joint 2015.6.16, “A Structure Principal Component Analysis for cryo-Electron Microscopy Images”, The 24th ICSA Applied Statistics Symposium and 13th Graybill Conference, Fort Collins, Colorado , USA.

36 2015.10.16 “My Learning Experience—about scientific writing”, the Department of Statistics, CUHK.

37 2016.3.8“Either/Or-----Introduction to Support Vector Machine”, seminar talk in NSYU.

38 2016.4.20 “專題報告的撰寫”, the Department of Statistics, National Taipei University.

39 2017.5.16 “Rank Selection for MPCA”, the Department of Statistics, Dong-Hai University.

40 2017.6.27 “Rank Selection for MPCA”, ICSA Symposium, Chicago, IL, USA.

41 2017.7.27-28 “A tensor transition probability and its applications to Blockchain”, 7th Probability and Statistics in Finance and Insurance - JSM Satellite Meeting.

42 2017.11.29-30. ‘Statistical Analysis for Cryo-electron Microscopy Images’, ISI-ISM-ISSAS Conf. Tokyo

43 2017.12.21 ‘Statistical Analysis for Cryo-electron Microscopy Images’，人工智慧於數據科學領域之應用論壇，中山大學。(Invited Speaker).

44 2018.2.17-21 ‘A Dimension Reduction Method for cryo-EM Image Analysis’. at the Computational Methods and Bioinformatics Session of Biophysics Society 2018 meeting.

45 2018.5.8 ‘A Model Bias Problem in Cryo-Electron Microscopy Image Analysis’, Department Seminar at Institute of Statistics, National Central University. (Invited Speaker).

46 2018.6.25 ‘Double Spending Fork Attack in Blockchain ‘, The Workshop for Blockchains, Probability and Statistics in Modern Financial Markets, Academia Sinica. (Invited Speaker).

47 2018.6.26, ‘Statistical Analysis for Cryo-electron Microscopy Images’, Big data in health sciences conference, NHRI, Taipei. (Invited Speaker).

48 2018.6.30-7.1 ‘A Model Bias Problem in Cryo-Electron Microscopy Image Analysis’, The Seventh International Biostatistics Workshop of Jilin University, Changchun, China. (Invited Speaker).

49 2018.7.2-7.5 ‘A Model Bias Problem in Cryo-Electron Microscopy Image Analysis’, International Chinese Statistical Association China Conference with the Focus on Data Science, Qingdao, China. (Invited Speaker).

50 2018.8.30 “Developing a cryo-EM computation platform with focus on Integration and Visualization”, Biweekly cryo-EM meeting at Institute of Biochemistry, Academia Sinica.

51 2018.9.3 “Einstein from noise and statistical de-nosing”, ASCEM’s Grand Opening Symposium and Workshop, Academia Sinica.

52 2018.10.18 “Statistical Analysis for cryo-EM images”, Department of Applied Mathematics, NSYU.

53 2018.12.20 “Building a Novel AI-System for Classifying Molecular Heterogeneity of Cryo-EM Image Analysis”, Grand Challenge Seed Program Workshop: Data Science, Academia Sinica.

54 2018.12.28 “ASCEP: A speedy and robust cryo-EM processing platform”, Symposium on Molecular Imaging, Biorhythms, and Quantitative Science in Biomedicine and Public Health, Academia Sinica.

55 2019.7.26 生圖演講 “Why is it so hard to learn statistics?”

56 2019.8.14``Statistical Methods for cryo-EM image analysis”, DSSV at Doshisha University, Kyoto, Japan.

57 2019.8.26 “Statistical Analysis for cryo-EM Images”, 2019 ONE DAY SYMPOSIUM ON DATA-DRIVEN AND PHYSICS-BASED ANALYTICS, Academia Sinica.

58 2019.11.6-7 “Introduction to PCA, KEPCA and its Application to cryo-EM images”, Waseda

University – Academia Sinica Data Science Workshop, Tokyo, Japan.

59 2019.11.21-23 “A two-stage dimension reduction method and its applications on highly contaminated image sets”, as a keynote speech in the International Symposium on Theories and Methodologies for Large Complex Data, Tsukuba, Japan.

60 2020.1.15 'Statistical Analysis for Cryo-EM Images', 統計諮詢合作社接待首爾大學，發表演講

61 2020.3.6 “Statistical Analysis for cryo-EM Images’’, NCTU Institute of Statistics, Seminar.

62 2020.3.9 “Statistical Analysis for cryo-EM Images’’, NTU Mathematics Colloquium.

63 2020.6.9 “Applications and Extensions of Principal Component Analysis: from a Top to Protein Structure Determination”, Colloquium at Institute of Physics, Academia Sinica.

64 2020.10.29 “Two-stage dimension reduction (2SDR) for noisy high-dimensional images and application to Cryogenic Electron Microscopy, invited lecture, NSYSU, The Department of Applied Mathematics.

65 2020.12.29 “Two-stage dimension reduction (2SDR) for noisy high-dimensional images and application to Cryogenic Electron Microscopy, 2020 ICCM on line presentation. (Invited Speaker).

66 2021.10.20 “Statistical Methods for cryo-EM Image Analysis”, National University of Singapore, Department of Statistics, on line presentation. (Invited Speaker).

67 2022.02.19 “Statistical Analysis for Cryo-EM Image Data”, 科技部自然司化學學門暨自然科學及永續研究推展中心化學組舉辦“物理化學小組 2022 春季交流研討會”(Invited Speaker).

68 2022.04.22 “Our learning experience on Deep Learning in learning the 3D protein structures from cryo-EM images”, IoP Machine Learning workshop (Invited Speaker).

69 2022.10.8 “Unintended Lies with Statistics”, 2022 Ethics Course at TIGP, Academia Sinica.

70 2022.10.29 “淺談數據 vs 科學”, 2022 中研院院區開放，統計所舉辦科普演講。

71 2022.12.2 “Garbage in, Einstein out: A Mathematical Study of Einstein from Noise”, OIST (Okinawa Institute of Science and Technology), Japan (Invited Speaker).

72 2023.2.24 “Garbage in, Einstein out”, Department of Statistics, George Mason University, VA, USA. (Invited Speaker).

73 2023.7.12 “A Robust Empirical Bayesian Model for Weighted Linear Regression: Application to Cryo-EM Analysis”, ISDCS, AS (Invited Speaker).

74 2023.8.11, “科學與統計＆統計科學研究所簡介”. 建北科研暑期營至統計所參訪，代表本所演講。

75 2023.11.4 “Good Statistical Practices (GSP): A must toward a successful and responsible science career”, 2023 Ethics Course at TIGP, Academia Sinica (Invited Speaker).

76 2024.5.28 “An Empirical Hierarchical Bayesian Method and Application to Cryo-EM Analysis”, SiegmundFest24, hosted by The Department of Statistics, Stanford University. (Invited Speaker). https://statistics.stanford.edu/events/siegmundfest24.

77 2024.9.18 “A Hierarchical Linear Model for Cryo-EM Analysis”, The Department of Statistics, Rutgers University (Invited Speaker).

78 2024.10.5 “Good Statistical Practices (GSP): A must toward a successful and responsible science

career", 2023 Ethics Course at TIGP, Academia Sinica (Invited Speaker).

Host for workshop, summer school and conferences

1. 2018.2.9 Poster Competition, ISSAS.
2. 2018.5.17-18 2018 統計教學工作坊, ISSAS.
3. 2018.6.25 The Workshop for Blockchains, Probability and Statistics in Modern Financial Markets, ISSAS.
4. 2018.7.30-8.10 Statistical Summer School, ISSAS.
5. 2018.12.7-11 Workshop on High-Dimensional Statistical Analysis, ISSAS.
6. 2018.12.28 Symposium on Molecular Imaging, Biorhythms, and Quantitative Science in Biomedicine and Public Health, Academia Sinica.
7. 2019.8.26 2019 One Day Symposium on Data-driven and physics-based analytics, ISSAS.
8. 2019.12.23 Symposium on Statistical Science in Biomedicine and Public Health, ISSAS.
9. 2019.12.27 Symposium on Molecular Imaging and Biorhythms, Academia Sinica, ISSAS.