

# An-Shun Tai (戴安順)

Assistant Professor at  
Institute of Statistics and Data Science, National Tsing Hua University, Taiwan  
[ashtai@stat.nthu.edu.tw](mailto:ashtai@stat.nthu.edu.tw)

Update: 2026/1/21

## 1. Education

---

Sept. 2012 ~ Apr. 2019, Ph.D. in **Institute of Statistics, National Tsing-Hua University**, Taiwan.

Thesis: Statistical deconvolution models for inferring cellular heterogeneity

Advisor: Wen-Ping Hsieh Ph.D.

Sept. 2009 ~ Jun. 2011, M.S. in **Institute of Statistics, National Tsing-Hua University**, Taiwan.

Thesis: Consistency of QTLs underlying the same gene regulatory modules

Advisor: Wen-Ping Hsieh Ph.D.

2004 ~2009, B.S. in **Department of Mathematics, National Tsing-Hua University**, Taiwan.

## 2. Research interests

---

- Biostatistics
- Bioinformatics (Statistical Genomics)
- Bayesian Inference (Bayesian variable selection)
- Causal Inference
- Mediation Analysis (Multiple Mediators)
- Mendelian Randomization (Instrumental Variable Analysis)
- Robust Estimation

## 3. Professional experience

---

- **Assistant Professor** Aug. 2025 ~ Now  
Institute of Statistics and Data Science, National Tsing Hua University, Taiwan
- **Adjunct Assistant Professor** Feb. 2025 ~ Jul. 2025  
Institute of Statistics and Data Science, National Tsing Hua University, Taiwan
- **Assistant Professor** Aug. 2022 ~ Jul. 2025  
Department of Statistics, National Cheng Kung University, Taiwan
- **Postdoctoral Fellow** Apr. 2019 ~ Jul. 2022  
Institute of Statistics, National Chiao Tung University, Taiwan
- **Predocctoral Visiting Scholar** Feb. 2017 ~ Jul. 2017  
Department of Biostatistics, University of Pittsburgh

## 4. Publications

---

### (A) Major work († indicates co-first author; \* indicates corresponding author)

*Published or in press:*

1. Yan-Lin Chen, Yan-Hong Chen, Pei-Fang Su, Huang-Tz Ou, and **An-Shun Tai\*** (2024). Robust inference for causal mediation analysis of recurrent event data. *Statistics in Medicine*. 43(16): 3020-3035. doi: 10.1002/sim.10118.
2. **An-Shun Tai** and Sheng-Hsuan Lin\* (2024). Multiply robust estimation of natural indirect effects with multiple ordered mediators. *Statistics in Medicine*. 43(4):656-673. doi: 10.1002/sim.9977
3. **An-Shun Tai** and Sheng-Hsuan Lin\* (2023). Complete effect decomposition for an arbitrary number of multiple ordered mediators with time-varying confounders: A method for generalized causal multi-mediation analysis. *Statistical Methods in Medical Research*. 32(1), 100-117.
4. **An-Shun Tai**, Sheng-Hsuan Lin\*, Yu-Cheng Chu, Tsung Yu, Milo A. Puhan, and Tyler VanderWeele (January 2023). Causal mediation analysis with multiple time-varying mediators. *Epidemiology*. 34(1):p 8-19
5. **An-Shun Tai**, Ro-Ting Lin\*, Yi-Chun Lin, Chung-Hsing Wang, Sheng-Hsuan Lin, Seiya Imoto (2022 Aug 25). Genome-wide causal mediation analysis identifies genetic loci associated with uterine fibroids mediated by age at menarche. *Human Reproduction*. 37(9):2197-2212. doi: 10.1093/humrep/deac136. (IF=6.353, Rank=4/31)
6. **An-Shun Tai**, Pei-Hsuan Lin, Yen-Tsung Huang, and Sheng-Hsuan Lin\* (2022). Path-specific effects in the presence of a survival outcome and causally ordered multiple mediators with application to genomic data. *Statistical Methods in Medical Research*. 31(10):1916-1933. doi:10.1177/09622802221104239
7. **An-Shun Tai**, Le-Hsuan Liao, and Sheng-Hsuan Lin\* (2022). On the conventional definition of path-specific effects - fully mediated interaction with multiple ordered mediators. *Epidemiology*. 33(6): p 817-827. DOI: 10.1097/EDE.0000000000001520
8. **An-Shun Tai**, Chun-Chao Wang, and Wen-Ping Hsieh\* (2022). Detection of cell separation-induced gene expression via a penalized deconvolution approach. *Statistics in Biosciences*. <https://doi.org/10.1007/s12561-022-09344-8>.
9. **An-Shun Tai** and Sheng-Hsuan Lin\* (2022). Identification and robust estimation of swapped direct and indirect effects: Mediation analysis with unmeasured mediator–outcome confounding and intermediate confounding. *Statistics in Medicine*. <https://doi.org/10.1002/sim.9501>.
10. **An-Shun Tai**, Yi-Juan Du, and Sheng-Hsuan Lin\* (2022). Robust inference on effects attributable to mediators: A controlled-direct-effect-based approach for causal effect decomposition with multiple mediators. *Statistics in Medicine*. <https://doi.org/10.1002/sim.9329>.
11. **An-Shun Tai**, Yen-Tsung Huang, Hwai-I Yang, Lauren V. Lan, and Sheng-Hsuan Lin\* (2022). G-computation to causal mediation analysis with sequential multiple mediators – investigating the vulnerable time window of HBV activity for the mechanism of HCV induced hepatocellular carcinoma. *Frontiers in Public Health*. doi: 10.3389/fpubh.2021.757942.
12. **An-Shun Tai** and Sheng-Hsuan Lin\* (2021). Integrated multiple mediation analysis: A robustness–specificity trade-off in causal structure. *Statistics in Medicine*. <https://doi.org/10.1002/sim.9079>.

13. **An-Shun Tai**, Chun-An Tsai, and Sheng-Hsuan Lin\* (2021). Survival mediation analysis with the death-truncated mediator: The completeness of the survival mediation parameter. *Statistics in Medicine*. <https://doi.org/10.1002/sim.9008>.
14. **An-Shun Tai**, George C. Tseng and Wen-Ping Hsieh\* (2021). BayICE: A Bayesian hierarchical model for semi-reference-based deconvolution of bulk transcriptomic data. *Annals of Applied Statistics*. 15(1) 391 - 411. <https://doi.org/10.1214/20-AOAS1376>.
15. **An-Shun Tai**, Chien-Hua Peng\*, Shih-Chi Peng, and Wen-Ping Hsieh\* (2018). Decomposing the subclonal structure of tumors with two-way mixture models on copy number aberrations. *PLOS ONE*. 13(12): e0206579.

*Papers under review or under revision:*

1. Han-Chi Peng, Woojoo Lee, **An-Shun Tai**\* (2026+). Robust estimation of population attributable fractions in the presence of multiple ordered mediators. *Under revision at Statistics in Medicine*.
2. **An-Shun Tai**, Yu-Cheng Chu, and Sheng-Hsuan Lin\* (2026+). Causal mediation analysis of non-mortality outcomes with follow-up truncated by death: Survivor natural direct and indirect effect. *Under revision at Biometrical journal*.
3. **An-Shun Tai**\* (2026+). Robust and flexible high-dimensional causal mediation model for DNA methylation studies. *In preparation*.
4. **An-Shun Tai**\* (2026+). Robust semiparametric estimation of average causal effects in Mendelian randomization under an intermediate variable intervention. *In preparation*.

## **(B) Collaborative work**

*Published or in press:*

1. Pei-Hsuan Hsia, **An-Shun Tai**, Shih-Chen Fu, Sheng-Hsuan Lin\* (2025). On identification and estimation for sufficient cause interaction through a quasi-instrumental variable. *Statistical Methods in Medical Research*, 34(12), 2237-2248.
2. Jiwoong Yu and Chanhee Kim and Jaeseong Oh and **An-Shun Tai** and Woojoo Lee\* (2025). On the robustness of truncated negative binomial regression model: application to field epidemiology. *Journal of Applied Statistics*.1-19.
3. Hyunman Sim, **An-Shun Tai**, Whanhee Lee, Woojoo Lee\* (2025). Sensitivity analysis for attributable fraction in the presence of unmeasured confounding. *American Journal of Epidemiology*. kwae409.
4. Pei-Hsuan Hsia, **An-Shun Tai**, Chu-Lan Michael Kao, Yu-Hsuan Lin, Sheng-Hsuan Lin\* (2025). Causal mediation analysis for difference-in-difference design and panel data. *Epidemiologic Methods*, vol. 14, no. 1, pp. 20240025. <https://doi.org/10.1515/em-2024-0025>
5. Pei-Shan Chien, Tzu-Jung Wong, **An-Shun Tai**, Yau-Huo Shr, Tsung Yu\* (2024). Examining the causal association between moderate alcohol consumption and cardiovascular risk factors in the Taiwan Biobank: a Mendelian randomization analysis. *Frontiers in Cardiovascular Medicine*, 11, 1456777.
6. Yi-Hsuan Lin, Chia-Hung Lin, Yu-Chih Lin, Yu-Yao Huang, **An-Shun Tai**, Shih-Chen Fu, Sheng-Hsuan Lin\* (2024). Sodium-Glucose Cotransporter 2 Inhibitors Reduce the Risk of Hospitalization for

Heart Failure and Amputation Rate Compared with Incretin-Based Therapy in Patients With Diabetic Foot Disease: A Nationwide Population-Based Study. *Endocrine Practice*, 30.5: 424-430.

7. Jui-Hsiang Lin, An-Shun Tai, and Sheng-Hsuan Lin\* (2022). Population Attributable Fraction based on sufficient causal framework for mediation settings. *Annals of Epidemiology*. 75:57-66. doi: 10.1016/j.annepidem.2022.08.050.
8. Tanbin Rahman, Hsin-En Huang, Yujia Li, An-Shun Tai, Wen-Ping Hsieh, Colleen McClung, and George C. Tseng\* (2022). A sparse negative binomial classifier with covariate adjustment for RNA-seq data. *Annals of Applied Statistics*. 16(2), 1071-1089.
9. Tzu-Yen Huang, Wing-Hei Viola, Feng-Yu Chiang, Che-Wei Wu, Shih-Chen Fu, An-Shun Tai, Yi-Chu Lin, Hsin-Yi Tseng, Ka-Wo Lee, Sheng-Hsuan Lin (2021). Correlation between Objective and Subjective High-Pitched Voice Impairment in Patients after Thyroid Surgery. *Frontiers in Endocrinology*.
10. Tzu-Yen Huang, Wing-Hei V. Yu, Feng-Yu Chiang, Che-Wei Wu, Shih-Chen Fu, An-Shun Tai, Yi-Chu Lin, Hsin-Yi Tseng, Ka-Wo Lee, and Sheng-Hsuan Lin (2021). How the Severity and Mechanism of Recurrent Laryngeal Nerve Dysfunction during Monitored Thyroidectomy Impact on Postoperative Voice. *Cancers* 13, no. 21: 5379. <https://doi.org/10.3390/cancers13215379>.
11. Yu-Hsuan Lin, Si-Yu Chen, Pei-Hsuan Lin, An-Shun Tai, Yuan-Chien Pan, Chang-En Hsieh, and Sheng-Hsuan Lin\* (2020). Assessing User Retention of a Mobile App: Survival Analysis. *JMIR Mhealth Uhealth*. 2020;8(11):e16309. DOI: 10.2196/16309
12. Yen-Tsung Huang, An-Shun Tai, Meng-Ying Chou, Geng-Xian Lin, and Sheng-Hsuan Lin\* (2020) Six-way decomposition of causal effects: Unifying mediation and mechanistic interaction. *Statistics in Medicine*. 1– 18. <https://doi.org/10.1002/sim.8708>.
13. Chien-Hua Peng, Chun-Ta Liao, Ka-Pou Ng, An-Shun Tai, Shih-Chi Peng, Jen-Pao Yeh, Shu-Jen Chen, Kuo-Chien Tsao, Tzu-Chen Yen\*, and Wen-Ping Hsieh\* (2015). Somatic copy number alterations detected by ultra-deep targeted sequencing predict prognosis in oral cavity squamous cell carcinoma. *Oncotarget*, 6(23), 19891.
14. Chien-Hua Peng, Yi-Zhi Jiang, An-Shun Tai, Chun-Bin Liu, Shih-Chi Peng, Chun-Ta Liao, Tzu-Chen Yen\*, and Wen-Ping Hsieh\* (2013). Causal inference of gene regulation with subnetwork assembly from genetical genomics data. *Nucleic Acids Research*.

*Papers under review or under revision:*

1. Hyunman Sim, An-Shun Tai, and Woojoo Lee (2026+). Sensitivity analysis of attributable fraction for time-to-event outcomes under unmeasured confounding. *Under review*.

### (C) Other work

1. An-Shun Tai, Shih-Wen Lin, and Sheng-Hsuan Lin\* (2020) Sample Size Calculations for the Multiple Mediation Model (in Chinese). *JCSA*. Vol. 58, 199–220.
2. An-Shun Tai, Yen-Tsung Huang, Wen-Chung Lee, and Sheng-Hsuan Lin\* (2020) Conceptualization of agonistic interaction under marginal sufficient component cause model – an alternative interpretation for subadditive interaction. *JCSA*. Vol. 58, 168–198.
3. An-Shun Tai and Sheng-Hsuan Lin\* (2022) Book review: “Fundamentals of Causal Inference With R”

## 5. Journal Referee

---

### (Statistics Journals)

- Journal of the American Statistical Association (JASA) (2024, 2025)
- Statistical Methods in Medical Research (2025\*2)
- Statistica Sinica (2021, 2022, 2023, 2024, 2026)
- Statistics in Medicine (2024)
- Lifetime Data Analysis (2024, 2025)
- Australian & New Zealand Journal of Statistics (2022)
- Journal of Data Science, Statistics, and Visualisation (2022)
- Journal of Applied Statistics (2025)
- Journal of Statistical Computation and Simulation (2025)

### (Bioinformatics Journals)

- BMC Medical Research Methodology (2023)
- Frontiers in Genetics (2022)
- BMC Bioinformatics (2022, 2024)
- Briefings in Bioinformatics (2021\*3)
- PLOS Computational Biology (2021)

### (Epidemiology Journals)

- American Journal of Epidemiology (2025)
- Journal of Clinical Epidemiology (2024)
- Archives of Public Health (2024)
- International Journal of Epidemiology (2022)
- BMJ public health (2025)

### (Scientific Journals)

- Machine Learning (2026)
- BMC Medical Informatics and Decision Making (2025)
- BMJ open (2025)
- Saudi Dental Journal (2025)
- BMC Musculoskeletal Disorders (2024)
- IEEE Transactions on Neural Networks and Learning Systems (2023)
- Frontiers in Endocrinology (2023)
- Contemporary Clinical Trials Communications (2023)
- Human reproduction (2023)
- Microbiome (2023)
- PLOS one (2022)
- Scientific reports (2020)

## 6. Grant Referee

---

- National Science and Technology Council (2023\*1, 2024\*2, 2026\*4)
- NSTC Research Grant for University Students (2023\*2)

## 7. Honors and Awards

---

- 2024 Outstanding Research Award (National Cheng Kung University - College of Management)
- 2024 Outstanding Research Award for Young Scholars, Taiwan Comprehensive University System (臺灣綜合大學系統 113 年度年輕學者創新研發成果 傑出獎)
- 2021 MOST Postdoctoral Researcher Academic Research Award (科技部 110 年度博士後研究人員學術研究獎)
- 2019 Travel grant award from Ministry of Science and Technology (MOST) to attend ASHG 2019 (國內專家學者出席國際學術會議)
- 2018 Honorary member of the Phi Tau Phi Scholastic Honor Society, Taiwan
- 2018 Travel grant award for PhD students from Ministry of Science and Technology (MOST) to attend JSM 2018 (科技部國內研究生出席國際學術會議)
- 2016 Travel grant award for PhD students from Ministry of Science and Technology (MOST) to attend ASHG 2016 (科技部國內研究生出席國際學術會議)
- 2015 Travel grant award for PhD students from Ministry of Science and Technology (MOST) to attend ASHG 2015 (科技部國內研究生出席國際學術會議)
- 2012 Recipient of President Scholarship granted by National Tsing-Hua University

## 8. Grants

---

- National Science and Technology Council, Taiwan 優秀年輕學者研究計畫 (NSTC 114-2628-M-006 -003 -MY4)  
**PI, 2025/08/01 ~ 2029/07/31, \$5,505,000**  
Project Title: An Integrated Proximal Causal Inference Framework for Mendelian Randomization, Mediation Analysis, Surrogate Endpoints, and Transportability.
- NCKU Sustainable Integrated Interdisciplinary Project 成功大學永續跨領域整合型計畫  
**PI, 2023/04/01 ~ 2024/12/31, \$1,850,000**  
Project Title: An integrative causal statistical framework applied to exploring the effects of non-invasive ultrasonic nerve stimulation on the hematopoietic system.
- NCKUH Smart Healthcare Interdisciplinary Project 智慧健康照護跨領域計畫 (NCKUH-11310014)  
**Co-PI, 2024/01/01 ~ 2024/12/31, \$706,800**  
Project Title: To investigate the germline genetic variants and immunotherapeutic resistance in

colorectal cancers with mismatch repair deficiency by next-generation sequencing, analysis of tumor heterogeneity and deep learning model.

- National Science and Technology Council, Taiwan (NSTC 111-2118-M-006 -010 -MY3)

**PI, 2022/09/01 ~ 2025/07/31, \$3,034,000**

Project Title: Statistical methods of causal mediation analysis by using instrumental variables:

Application to genomic studies.

## 9. Presentations

---

### (A) Invited Oral Presentation

1. *The 7th International Conference on Econometrics and Statistics (EcoSta 2024)* July 2024.  
--- Robust and Flexible High-Dimensional Causal Mediation Model for DNA Methylation Studies.
2. *2024 International Conference for Statistics and Data Science (Taiwan)*. July 2024.  
--- Robust and Flexible High-Dimensional Causal Mediation Model for DNA Methylation Studies.
3. *2023 International Conference for Statistics and Data Science (Taiwan)*. July 2023.  
--- Robust semiparametric estimation of average causal effects in Mendelian randomization under an intermediate variable intervention.
4. *2023 KSS-CSA-JSS Young Researcher's Session (Korea)*. July 2023.  
--- Robust semiparametric estimation of average causal effects in Mendelian randomization under an intermediate variable intervention.
5. *The 32th South Taiwan Statistics Conference (Taiwan)*. June 2023.  
--- Causal mediation analysis for recurrent event using additive rate models: generalizations from the Baron and Kenny method.
6. *The Asian Regional Section of the International Association for Statistical Computing (IASC- ARS) 2022 (Kyoto, JAPAN)*. February 2022.  
--- Robust inference on effects attributable to mediators: A controlled-direct-effect-based approach for causal effect decomposition with multiple mediators.
7. *The 30th South Taiwan Statistics Conference (Kaohsiung city, Taiwan)*. October 2021.  
--- Survival mediation analysis with the death-truncated mediator: The completeness of the survival mediation parameter
8. *The 29th South Taiwan Statistics Conference (Chiayi city, Taiwan)*. August 2020.  
--- A unified framework for causal multi-mediation analysis of tumor heterogeneity by gene expression profiling
9. 108 年中國統計學社社員大會暨 統計學術研討會. December 2019.  
--- Generalized interventional approach for causal mediation analysis with causally ordered multiple mediators.
10. Institute of Statistical Science, Academia Sinica, Taipei, Taiwan. September 2019  
--- General approach of causal mediation analysis for survival outcome under sequential mediators.

### (B) Contributed Oral Presentation and Poster

1. *Joint Statistical Meetings (JSM) 2024 (US)*. August 2024.  
--- Robust and Flexible High-Dimensional Causal Mediation Model for DNA Methylation Studies.

2. *Joint Statistical Meetings (JSM) 2023 (Canada)*. August 2023.  
--- Robust Semiparametric Estimation of Average Causal Effects in Mendelian Randomization under an Intermediate Variable Intervention.
3. *The 31th South Taiwan Statistics Conference (Taichung City, Taiwan)*. July 2022  
--- Multiply robust estimation of natural indirect effects with multiple ordered mediators
4. *The American Society of Human Genetics (ASHG) 2019 Annual Meeting (Houston, US)*. October 2019  
--- The investigation of cell separation-induced gene expression via a penalized deconvolution approach
5. *The 28th South Taiwan Statistics Conference (Taichung City, Taiwan)*. June 2019  
--- Causal mediation analysis with the mediator truncated by death in the survival study.
6. *Joint Statistical Meetings (JSM) 2018 (Vancouver, Canada)*. July 2018  
--- A Hierarchical Bayesian Deconvolution Model for Inferring Immune Cell Components in Tumor.
7. *The American Society of Human Genetics (ASHG) 2016 Annual Meeting (Vancouver, Canada)*. October 2016  
--- Inferring evolution structure based on copy number aberration from head and neck cancer via penalized two-way mixture Poisson model.
8. *The 25th South Taiwan Statistics Conference (Kaohsiung City, Taiwan)*. June 2016  
--- Copy number identification in clonal cell populations using spatially correlated two-way Poisson mixture models.
9. *The American Society of Human Genetics (ASHG) 2015 Annual Meeting (Baltimore, US)*. October 2015  
--- Reconstructing clonal evolutionary process among copy number variants in tumor.