

June En-Yu Lai Ph.D.

Contact Information

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Education

Ph.D. Bioinformatics, National Yang Ming University & Academia Sinica, TIGP*, 2017.
B.S. Biotechnology and Laboratory Science in Medicine, National Yang Ming University, 2008.

Research

AREAS OF INTEREST

Bioinformatics — Quantitative Proteomics and Genomics, NGS Sequence Analysis especially in Structural Variation, Development of Bioinformatic Algorithms, Networks and Pathways Analysis, Annotation and Enrichment Analysis.

Biostatistics — Causal Inference and Mediation Analysis, Statistical Genetics, Clinical Meta Analysis.

Analytic Philosophy — Metaphysical Causation and Causal Models, Epistemology.

DOCTORAL DISSERTATION

Functional Analysis for Quantitative Proteomic Data.

Advisor: Kun-Pin Wu.

Committee: Hsuan-Cheng Huang, Yi-Hau Chen, Wailap Victor Ng, Hsin-Chou Yang, and Kun-Pin Wu.

PUBLICATIONS IN REFEREED JOURNALS

Deleterious variants contribute minimal excess risk in large-scale testing.

Yen-Tsung Huang[†], **En-Yu Lai**[†], Jia-Ying Su[†], Hsueh-Ju Lu[†], Yen-Lin Chen[†], Jer-Yuarn Wu, Chun-yu Wei, Ling-Hui Li, Cathy S.-J. Fann, Hsin-Chou Yang, Chien-Hsiun Chen, Hung-Hsin Chen, Yi-Min Liu, Ming-Fang Tsai, Erh-Chan Yeh, Chih-Kuang Cheng, Yen-Po Wang, Nai-Fang Chi, I-Cheng Lee, Harn-Shen Chen, Yun-Cheng Hsieh, Yi-Chu Liao, Shao-Jung Hsu, Shuo-Ming Ou, Kuan-Lin Lai, Chung-Chi Lin, Yi-Jen Chen, Chia-Ming Chang, Peng-Hui Wang, Yung-Hung Luo, Yun-Ting Chang, Chih-Chiang Chen, Yu-Cheng Hsieh, Yi-Ming Chen, Tzu-Hung Hsiao, Ching-Heng Lin, Yen-Ju Chen, I-Chieh Chen, Chien-Lin Mao, Shu-Jung Chang, Yen-Lin Chang, Yi-Ju Liao, Chih-Hung Lai, Wei-Ju Lee, Hsin Tung, Ting-Ting Yen, Hsin-Chien Yen, Shy-Shin Chang, Yu-Sheng Chang, Ting-I Lee, Shaoh-Der Yeh, Mei-Yi Wu, Ming-Shun Wu, Lung Wen Tsai, Cai-mei Zheng, Yu-Mei Chien, Tsung-Hsien Lin, Yen-Hsu Chen, Cheng-Che E. Lan, Jeng-Hsien Yen, Wen-Chen Liang, Te-Fu Chan, Shyh-Shin Chiou, Shih-Chang Chuang, Shang-Jyh Hwang, Yi-Jung Lin, Yu-Chuang Huang, Wan-Ru Li, Tsai-Chuan Chen, Wei-Ting Huang, Kuan-Chih Chen, Shin-Yee Lim, Yi-Shiuan Shen, Chia-Chia Huang, Chien-Hung Chen, Ya-Chung Tian, Chia-Ling Chen, Yao-Fan Fang, Ji-Tseng Fang, Yi-Hao Yen, Wei-Chi Wu, Wen-Shih Huang, Chi-Chin Sun, Wen-Chien Chou, Ching-Hung Lin, Tsung-Hua Yang, Pei-Lin Lee, Ming-Yang Wang, Tsen-Fang Tsai, Tung-Hung Su, Jyh-Ming Liou, Shun-Fa Yang, Chia-Chuan Hsieh, Chih-Chien Sung, Feng-Chih Kuo, Shih-Hua Lin, Dueng-Yuan Hueng, Chien-Jung Lin, Hueng-Yuan Shen, Chang-Hsun Hsieh, Shinn-Zong Ling, Tso-Fu Wang, Tsung-Jung Ho, Pei-Wei Shueng, Chen-Hsi Hsieh, Kuo-Shyang Jeng, Gwo-Chin Ma, Ting-Yu Chang, Han-Sun Chiang, Yi-Tien Lin, Kuo-Jang Kao, Chen-Fang Hung, I-Mo Fang, Po-Yueh Chen, Kochung Tsui, Pui-Yan Kwok, Wei-Jen Yao, Shiou-Sheng Chen, Ming Chen, Chih-Yang Huang, Da-Wei Wang, and Chun-houh Chen

— under review. (<https://www.medrxiv.org/content/10.1101/2024.10.21.24315653v1>)

*Taiwan International Graduate Program by Academia Sinica.

Causal mediation analysis for integrating exposure, genomic and phenotype data.

Haoyu Yang, Zhonghua Liu, Ruoyu Wang, **En-Yu Lai**, Joel Schwartz, Andrea A. Baccarelli, Yen-Tsung Huang, and Xihong Lin
 – Annual Review of Statistics and Its Application (2024), Volume 12, in press.

Causal inference in the multiverse of hazard.

En-Yu Lai and Yen-Tsung Huang.

– Causal Inference. PCIC 2024. Communications in Computer and Information Science (2025) Volume 2200, Pages 15-24. (arXiv:2405.04446)

Identifying pleiotropic genes via the composite test amidst the complexity of polygenic traits.

En-Yu Lai and Yen-Tsung Huang.

– Briefings in Bioinformatics (2024), Volume 25, Issue 4, bbae327

Genome-wide multimediator analyses using the generalized Berk–Jones statistics with the composite test.

En-Yu Lai and Yen-Tsung Huang.

– Bioinformatics (2023), Volume 39, Issue 9, btad544.

Hypertension as a novel link for shared heritability in age at menarche and cardiometabolic traits.

Hsien-Yu Fan, Kuo-Liong Chien, Yen-Tsung Huang, Justin BoKai Hsu, Yun-Yu Chen, **En-Yu Lai**, Jia-Ying Su, Tzu-Pin Lu, Hung-Yuan Li, Shih-Yuan Hsu, Yang-Ching Chen.

– The Journal of Clinical Endocrinology & Metabolism (2023) Volume 108, Issue 9, Pages 2389-2399.

NK cell receptor and ligand composition influences the clearance of SARS-CoV-2.

Wan-Chen Hsieh, **En-Yu Lai**, Yu-Ting Liu, Yi-Fu Wang, Yi-Shiuan Tzeng, Lu Cui, Yun-Ju Lai, Hsiang-Chi Huang, Jia-Hsin Huang, Hung-Chih Ni, Dong-Yan Tsai, Jian-Jong Liang, Chun-Che Liao, Ya-Ting Lu, Laurence Jiang, Ming-Tsan Liu, Yao-Ming Chang, Gerlinde Wernig, Chia-Wei Li, Kuo-I Lin, Yi-Ling Lin, Huai-Kuang Tsai, Yen-Tsung Huang, and Shih-Yu Chen

– Journal of Clinical Investigation (2021) Volume 131, Issue 21, e146408.

Estimating the causal effect of embryo transfer day on clinical in vitro fertilization outcomes using propensity score matching.

Han-Chih Hsieh, Chun-I Lee, **En-Yu Lai**, Jia-Ying Su, Yi-Ting Huang, Wei-Lin Zheng, Chien-Hong Chen, Chun-Chia Huang, Pin-Yao Lin, Maw-Sheng Lee, Mark Liu and Yen-Tsung Huang

– BMC Pregnancy and Childbirth (2021) Volume 21, Issue 1, Article number: 554, <https://doi.org/10.1186/s12884-021-04013-y>

A mediator analysis for a binary non-rare outcome with sequentially ordered multiple mediators.

En-Yu Lai[†], Stephannie Shih[†], Yen-Tsung Huang, and Shunping Wang.

– Statistics in Medicine (2020) Volume 39, Issue 10, Pages 1415-1428.

Drug class, renal elimination, and outcomes of direct oral anticoagulants in Asian patients: A meta-analysis.

Kang-Ling Wang, Chun-Chih Chiu, Robert Giugliano, Doreen Tan, Chun-Yi Lin, **En-Yu Lai**, Shinya Goto, and Chern-En Chiang.

– Journal of Stroke and Cerebrovascular Diseases (2018) Volume 27, Issue 4, Pages 857-864.

A knowledge-based T^2 -statistic to perform pathway analysis for quantitative proteomic data.

En-Yu Lai, Yi-Hau Chen, and Kun-Pin Wu.

– PLoS Computational Biology (2017) Volume 13, Issue 6, e1005601.

Once- or twice-daily mon-vitamin K antagonist oral anticoagulants in Asian patients with atrial fibrillation: A meta-analysis of randomized controlled trials.

Kang-Ling Wang, Chun-Chih Chiu, Doreen Su-Yin Tan, Chun-Yi Lin, **En-Yu Lai**, Shinya Goto, Robert P. Giugliano, and Chern-En Chiang.

– Journal of the Formosan Medical Association (2017) Volume 116, Issue 8, Pages 591-598.

Extracranial arterial and venous thromboembolism in patients with atrial fibrillation: A meta-analysis of randomized controlled trials.

Kang-Ling Wang, Harry R. Büller, Shinya Goto, Chun-Yi Lin, **En-Yu Lai**, Chun-Chih Chiu, Chern-En Chiang, and Robert P. Giugliano.

– Heart Rhythm (2017) Volume 14, Issue 4, Pages 599-605.

Standard versus low dose non-Vitamin K antagonist oral anticoagulants in asian patients with atrial fibrillation: A meta-analysis of contemporary randomized controlled trials.

Kang-Ling Wang, Robert P. Giugliano, Shinya Goto, Chun-Chih Chiu, Chun-Yi Lin, **En-Yu Lai**, and Chern-En Chiang.

– Heart Rhythm (2016) Volume 13, Issue 12, Pages 2340-2347.

A linear-time algorithm for reconstructing zero-recombinant haplotype configuration on a pedigree.

En-Yu Lai, Wei-Bung Wang, Tao Jiang, and Kun-Pin Wu.

– BMC Bioinformatics (2012) Volume 13, Supplement 17, S19.

[†]Equally contributed.

BOOK CHAPTERS

因果之間 《中國統計學報》 因果專刊

賴恩語，黃彥棕

因果模型與因果推理 《邏輯哲學的重要論題》 第六篇

賴恩語，王文方

INVITED TALKS / CONFERENCE TALKS

Reframing crossworld independence for identifying path-specific effects.

– South Taiwan Statistics Conference (STSC) 2024 in Kaohsiung, oral presentation

– ISI-ISM-ISSAS Joint Conference 2025 in Tokyo, poster presentation

Identifying pleiotropic genetic factors associated with multiple cancers in the TPMI cohort.

– South Taiwan Statistics Conference (STSC) 2023 in Hualien, oral presentation

Causal inference in the multiverse of hazard.

– The 6th Pacific Causal Inference Conference proceeding (PCIC) 2024 in Shanghai, oral presentation

– The 14th HOPE meeting (HOPE) 2023 in Tsukuba, oral presentation

Identifying pleiotropic genes via the composite test amidst the complexity of polygenic traits.

– ISI-ISM-ISSAS Joint Conference 2024 in Kolkata, oral presentation

– GIW 2023 and ISCB-Asia VI Joint Conference in Singapore, poster presentation

– ISI-ISM-ISSAS Joint Conference 2023 in Taipei, oral presentation

– South Taiwan Statistics Conference (STSC) 2022 in Taichung, oral presentation

Genome-wide multimediator analyses using the generalized Berk–Jones statistics with the composite test.

– South Taiwan Statistics Conference (STSC) 2021 in Kaohsiung, oral presentation

– ISMB/ECCB 2021 virtual conference, poster presentation

– South Taiwan Statistics Conference (STSC) 2020 in Chiayi, oral presentation

A mediator analysis for a binary non-rare outcome with sequentially ordered multiple mediators.

– Chinese Statistical Association Taiwan (CSAT) Annual Meeting 2019 in Hsinchu, oral presentation

Mediation analyses of ultraviolet, air pollution, and structural variations using the Taiwan Biobank.

– ICSA International Conference 2019 in Hangzhou, oral presentation

– South Taiwan Statistics Conference (STSC) 2019 in Taichung, oral presentation

– ISI-ISM-ISSAS Joint Conference 2019 in Taipei, oral presentation

– Program in Quantitative Genomics (PQG) 2018 in Boston, poster presentation

A genetic algorithm to locate responsive subpathways for time-course proteomic data.

– HUPO 2016 in Taipei, oral presentation

A knowledge-based T^2 -statistic to perform pathway analysis for quantitative proteomic data.

– ISMB/ECCB 2017 in Prague, poster presentation

– Taiwan Proteomics Society (TPS) Annual Meeting 2014 in Taipei, poster presentation

– RECOMB 2013 in Beijing, poster presentation

A linear-time algorithm for reconstructing zero-recombinant haplotype configuration on a pedigree.

– InCoB 2012 in Bangkok, oral presentation

– ISMB 2010 in Boston, poster presentation

SCIENTIFIC SOFTWARE

PGCtest: Identifying pleiotropic genes under a composite null. [Briefings in Bioinformatics, 2024]

<https://github.com/roqe/PGCtest> [R-package]

MACTest: Multi-mediator analyses under a composite null. [Bioinformatics, 2023]

<https://github.com/roqe/MACTest> [R-package]

SOMM: Mediation analysis with sequentially ordered multiple mediators. [Statistics in Medicine, 2020]

<https://github.com/roqe/SOMM> [R-package]

T2GA: Pathway analysis under a self-contained null. [PLoS Computational Biology, 2017]

<https://github.com/roqe/T2GA> [R-package]

KCHI: A linear-time algorithm for haplotype inference. [BMC Bioinformatics, 2012]

<https://github.com/roqe/KCHI> [C-source]

Experiences

POSTDOCTORAL FELLOW

Algorithm development under multi-mediator models, bioinformatic analysis of Taiwan Biobank/TPMI data.

– In Dr. Huang’s lab at Institute of Statistical Science, Academia Sinica, 2017 – present.

CONSULTANT

Cooperation Center of Statistics and Data Science at Academia Sinica, Nov 2019 – present.

General Clinical Research Center at Taipei Veterans General Hospital, Jan 2016 – Sept 2017.

LECTURER

TIGP [MBAS/MCB/MM] 2019 – present: Biostatistics

Summer 2018: Introduction to statistical learning with applications in R

TEACHING ASSISTANT

Autumn 2015: Introduction to statistical learning and data mining

Spring 2014: Bioinformatic algorithms; Machine learning and statistical inference

Autumn 2012: An overview of computer science

Autumn 2010: Basic molecular biology; Algorithms and data structures

RESEARCH ASSISTANT

Algorithm development of gene ontology, network module and pathway analysis for quantitative proteomic data.

– In Dr. Wu’s lab at Institute of BioMedical Informatics, National Yang Ming University, 2015 – 2017.

– In Dr. Chen’s lab at Institute of Chemistry, Academia Sinica, 2012 – 2015.

Algorithmic studies of protein identification with glycosylation.

– In Dr. Wu’s lab at Institute of BioMedical Informatics, National Yang Ming University, 2008 – 2009.

VISITING RESEARCHER

A linear-time algorithm for reconstructing zero-recombinant haplotype configuration on a pedigree.

– In Dr. Jiang’s lab at Bioinformatics Division, TNLIST[†], Beijing, Summer 2009.

INTERNSHIP

Medical Technologist at *Taipei Veterans General Hospital*, July 2007 – January 2008.

MISCELLANEOUS

Translator at *Research Ethics Education*, Jun 2014 – Mar 2015.

Database developer at *MSI Taiwan*, Jan 2013 – Mar 2014.

[†]Tsinghua National Laboratory for Information Science and Technology

Honors & Awards

FELLOWSHIPS

Academia Sinica Postdoctoral Fellowship, July 2020 – June 2022 (proposal acceptance rate: ~30%).

Academia Sinica Postdoctoral Fellowship, December 2018 – June 2020 (proposal acceptance rate: ~30%).

NSC and ISCB Travel Grant for attending *RECOMB 2013*.

NSC and APBioNET Travel Grant for attending *InCoB 2012*.

NSC Travel Grant for attending *ISMB 2010*.

TIGP Doctoral Fellowship, September 2009 – August 2012.

NYMU Student Exchange Fellowship for internship at *TNLIST* during 2009 summer.

OTHERS

HOPE 2023, 14th HOPE Fellow, as the representative of Academia Sinica, Taiwan.

GYSS 2021, Invited Attendee, as the representative of Academia Sinica, Taiwan.

References

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Yi-Hau Chen

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Wen-Fang Wang

Distinguished Professor

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