Curriculum Vitae[1]

Personal Information

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Education

Ph.D. in Biostatistics	June 2000	Johns Hopkins University, USA
M.S. in Statistics	June 1992	National Tsing Hua University, Taiwan
B.S. in Mathematical Science	June 1990	National Chengchi University, Taiwan

Professional Experiences

2021/8-present	Director, Institute of Statistics National Yang Ming Chiao Tung University, Taiwan
2021/2-present	Professor, Institute of Statistics National Yang Ming Chiao Tung University, Taiwan
2021/2-present	Adjunct Professor, Institute of Data Science and Engineering National Yang Ming Chiao Tung University, Taiwan
2018/8-2018/12	Visiting Scholar, Institute of Information Science Academia Sinica, Taiwan
2015/8-2021/1	Adjunct Professor, Institute of Data Science and Engineering National Chiao Tung University, Taiwan
2012/8-2018/7	Director, Institute of Statistics National Chiao Tung University, Taiwan

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2011/8-2021/1	Professor, Institute of Statistics National Chiao Tung University, Taiwan
2004/8-2011/7	Associate Professor, Institute of Statistics National Chiao Tung University, Taiwan
2003/8-2004/7	Assistant Professor, Institute of Statistics National Chiao Tung University, Taiwan
2000/8-2003/7	Assistant Professor, Department of Population Health Sciences University of Wisconsin-Madison, USA
2000/8-2003/7	Assistant Professor, Department of Biostatistics and Medical Informatics University of Wisconsin-Madison, USA
1998-2000	Statistical Consultant, Department of Health Policy and Management Johns Hopkins University, USA
1998-1999	Consulting Statistician, Biostatistics Center Johns Hopkins University, USA
1996-1998	Research Assistant, The Wilmer Institute Johns Hopkins University, USA
1994-1995	Research Assistant, Institute of Statistical Science Academia Sinica, Taiwan

Research Interests

Biostatistics
Epidemiologic methods
Genetic statistics and epidemiology
Bioinformatics
Multivariate statistics
High dimensional data analysis
Bayesian analysis
Machine learning
Data science
Medical image analysis

Academic Honors

Best Teaching Award, National Chiao Tung University (May 2012).

Dean's Special Recognition Award, College of Science, National Chiao Tung University (May 2005).

Margaret Merrell Award for excellence in research, Department of Biostatistics, Johns Hopkins University (April 2000).

Student Award for student paper competition, International Chinese Statistical Association (June 1999).

Mr. Hung-Ching Chow Scholarship for outstanding performance in mathematics (December 1988).

Professional Afflictions

American Statistical Association
International Biometric Society
International Chinese Statistical Association
Psychometric Society

Reviewer of *American Journal of Epidemiology*, *Archives of Ophthalmology*, *Biometrics*, *BMC Geriatrics*, *Communications in Statistics Theory and Methods*, *Comprehensive Psychiatry*, *Computational Statistics*, *Computational Statistics and Data Analysis*, *Education Researcher*, *Journal of Data Science*, *Journal of the American Statistical Association*, *Nursing Research*, *PLoS ONE*, *Psychometrika*, *Sociological Methodology*, *Statistica Sinica*, *Statistics in Medicine*.

Publications (* Corresponding author)

Schubert CR*, Fischer ME, Pinto AA, Paulsen AJ, Chen Y, **Huang GH**, Klein BEK, Tsai MY, Merten N, Cruickshanks KJ: Inflammation, metabolic dysregulation and environmental neurotoxins and risk of cognitive decline and impairment in midlife. *Neurological Sciences* 44(1):149-157, 2023 January.

Huang GH*, Fu QJ, Gu MZ, Lu NH, Liu KY, Chen TB: Deep transfer learning for the multilabel classification of chest X-ray images. *Diagnostics* 12:1457, 2022 June.

Lee P, Chen TB, Liu CH*, Wang CY, **Huang GH**, Lu NH: Identifying the posture of young adults in walking videos by using a fusion artificial intelligent method. *Biosensors* 12:295, 2022 May.

Paulsen AJ*, Pinto A, Fischer ME, Chen Y, **Huang GH**, Klein BEK, Klein R, Cruickshanks KJ: Generational differences in the 10-year incidence of impaired contrast sensitivity. *Ophthalmic Epidemiology* 28(2):175-182, 2021 April.

Paulsen AJ*, Pinto A, Merten N, Chen Y, Fischer ME, **Huang GH**, Klein BEK, Schubert CR, Cruickshanks KJ: Factors associated with the macular ganglion cell-inner plexiform layer thickness in a cohort of middle-aged U.S. adults. *Optometry and Vision Science* 98(3):295-305, 2021 March.

Tsou PH, Lin ZL, Pan YC, Yang HC, Chang CJ, Liang SK, Wen YF, Chang CH, Chang LY, Yu KL, Liu CJ, Keng LT, Lee MR, Ko JC*, **Huang GH***, Li YK*: Exploring volatile organic compounds in breath for high-accuracy prediction of lung cancer. *Cancers* 13(6):1431, 2021 March.

Paulsen AJ*, Fischer ME, Pinto A, Merten N, Dillard LK, Schubert CR, **Huang GH**, Klein BEK, Tweed TS, Cruickshanks KJ: Incidence of hearing impairment and changes in pure-tone average across generations. *JAMA Otolaryngology-Head & Neck Surgery* 147(2):151-158, 2021 February.

Huang GH*, Lin CH, Cai YR, Chen TB, Hsu SY, Lu NH, Chen HY, Wu YC: Multiclass machine learning classification of functional brain images for Parkinson's disease stage prediction. *Statistical Analysis and Data Mining* 13(5):508-523, 2020 October.

Merten N*, Paulsen AJ, Pinto AA, Chen Y, Dillard LK, Fischer ME, **Huang GH**, Klein BEK, Schubert CR, Cruickshanks KJ: Macular ganglion cell-inner plexiform layer as a marker of cognitive and sensory function in midlife. *Journals of Gerontology Series A-Biological Sciences and Medical Sciences* 75(9):e42-e48, 2020 September.

Wei YC, **Huang GH***: CONY: A Bayesian procedure for detecting copy number variations from sequencing read depths. *Scientific Reports* 10:10493, 2020 June.

Dalton DS, Schubert CR*, Pinto A, Fischer ME, **Huang GH**, Klein BEK, Klein R, Pankow JS, Paulsen AJ, Tsai MY, Tweed TS, Cruickshanks KJ: Cadmium, obesity, and education, and the 10-year incidence of hearing impairment: The Beaver Dam Offspring Study. *Laryngoscope* 130(6):1396-1401, 2020 June.

Schubert CR*, Cruickshanks KJ, Fischer ME, Pinto AA, Chen Y, **Huang GH**, Klein BEK, Klein R, Pankow JS, Paulsen AJ, Dalton DS, Tweed TS: Sensorineural impairments, cardiovascular risk factors, and 10-Year incidence of cognitive impairment and decline in midlife: The Beaver Dam Offspring Study. *Journals of Gerontology Series A-Biological Sciences and Medical Sciences* 74(11):1786-1792, 2019 October.

Chen CCH*, Yang YT, Lai IR, Lin BR, Yang CY, Huang J, Tien YW, Chen CN, Lin MT, Liang JT, Li HC, **Huang GH**, Inouye SK: Three nurse-administered protocols reduce nutritional decline and frailty in older gastrointestinal surgery patients: a cluster randomized trial. *Journal of the American Medical Directors Association* 20(5):524-529.e3, 2019 May.

Cruickshanks KJ*, Nondahl DM, Johnson LJ, Dalton DS, Fisher ME, **Huang GH**, Klein BE, Klein R, Schubert CR: Generational differences in the 5-year incidence of age-related macular degeneration. *JAMA Ophthalmology* 135(12):1417-1423, 2017 December.

Chen CCH, Li HC, Liang JT, Lai IR, Purnomo JDT, Yang YT, Lin BR, Huang J, Yang CY, Tien YW, Chen CN, Lin MT, **Huang GH***, Inouye SK: Effect of a modified hospital elder life program on delirium and length of hospital stay in patients undergoing abdominal surgery: A cluster randomized clinical trial. *JAMA Surgery* 152(9):827-834, 2017 September.

Tsai MH, Ku SC, Wang TG, Hsiao TY, Lee JJ, Chan DC, **Huang GH**, Chen CCH*: Swallowing dysfunction following endotracheal intubation: Age matters. *Medicine* 95(24):e3871. doi: 10.1097/MD.0000000000003871, 2016 June.

Huang GH*: Model identifiability. *Wiley StatsRef: Statistics Reference Online*. John Wiley & Sons. DOI: 10.1002/9781118445112.stat06411.pub2, 2016 May.

Xu YJ, Cheng JC, Lee JM, Huang PM, **Huang GH**, Chen CCH*: A walk-and-eat intervention improves outcomes for patients with esophageal cancer undergoing neoadjuvant chemoradiotherapy. *Oncologist* 20(10):1216-1222, 2015 October.

Pan JC, Liu CM, Hwu HG, **Huang GH***: Allocation variable-based probabilistic algorithm to deal with label switching problem in Bayesian mixture models. *PLoS One* 10(10):e0138899. doi: 10.1371/journal.pone.0138899, 2015 October.

Schubert CR*, Cruickshanks KJ, Fischer ME, **Huang GH**, Klein R, Tsai MY, Pinto AA: Carotid intima media thickness, atherosclerosis, and 5-year decline in odor identification: The Beaver Dam Offspring Study. *Journals of Gerontology Series A-Biological Sciences and Medical Sciences* 70(7):879-884, 2015 July.

Li HC, Chen YS, Chiu MJ, Fu MC, **Huang GH**, Chen CCH*: Delirium, subsyndromal delirium, and cognitive changes in individuals undergoing elective coronary artery bypass graft surgery. *Journal of Cardiovascular Nursing* 30(4):340-345, 2015 July-August.

Huang CL*, Hwang TJ*, Chen YH, **Huang GH**, Hsieh MH, Chen HH, Hwu HG: Intramuscular olanzapine versus intramuscular haloperidol plus lorazepam for the treatment of acute schizophrenia with agitation: An open-label, randomized controlled trial. *Journal of the Formosan Medical Association* 114(5):438-445, 2015 May.

Chen CCH*, Lin MT, Liang JT, Chen CM, Yen CJ, **Huang GH**: Pre-surgical geriatric syndromes, frailty, and risks for postoperative delirium in older patients undergoing gastrointestinal surgery: prevalence and red flags. *Journal of Gastrointestinal Surgery* 19(5):927-934, 2015 May.

Su H, Hsiao TY, Ku SC, Wang TG, Lee JJ, Tzeng WC, **Huang GH**, Chen CCH*: Tongue weakness and somatosensory disturbance following oral endotracheal extubation. *Dysphagia* 30(2):188-195, 2015 April.

Fischer ME*, Schubert CR, Nondahl DM, Dalton DS, **Huang GH**, Keating BJ, Klein BE, Klein R, Tweed TS, Cruickshanks KJ: Subclinical atherosclerosis and increased risk of hearing impairment. *Atherosclerosis* 238(2):344-349, 2015 February.

Fischer ME*, Cruickshanks KJ, Pankow JS, Pankratz N, Schubert CR, **Huang GH**, Klein BE, Klein R, Pinto A: The associations between 6-n-propylthiouracil (PROP) intensity and taste intensities differ by TAS2R38 haplotype. *Journal of Nutrigenetics and Nutrigenomics* 7(3):143-

152, 2014.

Pan JC, **Huang GH***: Bayesian inferences of latent class models with an unknown number of classes. *Psychometrika* 79(4):621-646, 2014 October.

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Chen SP, **Huang GH***: A Bayesian clustering approach for detecting gene-gene interactions in high-dimensional genotype data. *Statistical Applications in Genetics and Molecular Biology* 13(3):275-297, 2014 June.

Huang GH*, Tseng YC: Genotype imputation accuracy with different reference panels in admixed populations. *BMC Proceedings* 8(Suppl 1):S64, 2014 June.

Chen CM, **Huang GH**, Chen CCH*: Older patients' depressive symptoms 6 months after prolonged hospitalization: Course and interrelationships with major associated factors. *Archives of Gerontology and Geriatrics* 58(3):339-343, 2014 May-June.

Paulsen A*, Cruickshanks KJ, Fischer ME, **Huang GH**, Klein BE, Klein R, Dalton DS: Dry eye in the Beaver Dam Offspring Study: prevalence, risk factors, and health-related quality of life. *American Journal of Ophthalmology* 157(4):799-806, 2014 April.

Chen CCH*, Chen CN, Lai IR, **Huang GH**, Saczynski JS, Inouye SK: Effects of a modified hospital elder life program on frailty among patients undergoing major elective abdominal surgery. *Journal of the American Geriatrics Society* 62(2):261-268, 2014 February.

Tang ST*, **Huang GH**, Wei YC, Chang WC, Chen JS, Chou WC: Trajectories of caregiver depressive symptoms while providing end-of-life care. *Psycho-Oncology* 22(12):2702-2710, 2013 December.

Fischer ME*, Cruickshanks KJ, Schubert CR, Pinto A, Klein R, Pankratz N, Pankow JS, **Huang GH**: Factors related to fungiform papillae density: The Beaver Dam Offspring Study. *Chemical Senses* 38(8):669-677, 2013 October.

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Fischer ME*, Cruickshanks KJ, Schubert CR, Pinto A, Klein BEK, Klein R, Nieto JF, Pankow JS, **Huang GH**, Snyder DJ: Taste intensity in the Beaver Dam Offspring Study. *Laryngoscope* 123(6):1399-1404, 2013 June.

Nash SD*, Cruickshanks KJ, **Huang GH**, Klein BEK, Klein R, Nieto FJ, Tweed TS: Unmet hearing health care needs: The Beaver Dam Offspring Study. *American Journal of Public Health*

103(6):1134-1139, 2013 June.

Guo Y, Lanktree MB, Taylor KC, Fairfax BP, Elbers CC, Barnard J, Farrall M, Padmanabhan S, Baumert J, Castillo BA, Gaunt TR, Gong Y, Rajagopalan R, Romaine SP, Kumari M, Rafelt S, Smith EN, Li YR, Sivapalaratnam S, van Iperen EP, Speliotes EK, Toskala E, Zhang L, Ochs-Balcom HM, Bhangale TR, Chandrupatla HR, Drenos F, Gieger C, Gupta J, Johnson T, Kleber ME, Makino S, Mangino M, Meng Y, Nelson CP, Pankow JS, Pankratz N, Price TS, Shaffer J, Shen H, Tischfield S, Tomaszewski M, Atwood LD, Bailey KM, Balasubramanyam A, Baldwin CT, Basart H, Bauer F, Behr ER, Beitelshees AL, Berenson GS, Beresford SA, Bezzina CR, Bhatt DL, Boer JM, Braund PS, Burke GL, Burkley B, Carty C, Chen W, Clarke R, Cooper-DeHoff RM, Curtis SP, de Bakker PI, de Jong JS, Delles C, Dominiczak AF, Duggan D, Feldman HI, Furlong CE, Gorski MM, Gums JG, Hardwick R, Hastie C, Heid IM, **Huang GH**, Huggins GS, Humphries SE, Kirkland SA, Kivimaki M, Klein R, Klein BE, Knowler WC, Kottke-Marchant K, LaCroix AZ, Langaee TY, Li M, Lyon HN, Maiwald S, Marshall JK, Mehta A, Meijs MF, Melander O, Meyer N, Mitra N, Molony CM, Morrow DA, Murugesan G, Newhouse SJ, Nieto JF, Onland-Moret NC, Ouwehand WH, Palmen J, Pepine CJ, Ranchalis J, Rosas SE, Rosenthal EA, Scharnagl H, Schork NJ, Schreiner PJ, Shah T, Shashaty M, Shimbo D, Srinivasan SR, Thomas F, Tobin MD, Tsai MY, Verschuren WM, Wagenknecht LE, Winkelmann BR, Young T, Yusuf S, Zafarmand MH, Zmuda JM, Zwinderman AH, Anand SS, Balmforth AJ, Boehm BO, Boerwinkle E, Burton PR, Cappola TP, Casas JP, Caulfield MJ, Christiani DC, Christie J, Cruickshanks KJ, Davey-Smith G, Davidson KW, Day IN, Doevendans PA, Dorn GW 2nd, FitzGerald GA, Hall AS, Hingorani AD, Hirschhorn JN, Hofker MH, Hovingh KG, Illig T, Jamshidi Y, Jarvik GP, Johnson JA, Kanetsky PA, Kastelein JJ, Koenig W, Lawlor DA, März W, McCaffery J, Mega JL, Mitchell BD, Murray SS, O'Connell JR, Patel SR, Peters A, Pettinger M, Rader DJ, Redline S, Reilly MP, Sabatine MS, Schadt EE, Shuldiner AR, Silverstein RL, Spector TD, Taylor HA, Thorand B, Trip MD, Watkins H, Wichmann HE, Fox CS, Grant SF, Peter I, Talmud PJ, Munroe PB, Wilson JG, Knight JC, Samani NJ, Hegele RA, Asselbergs FW, Monda KL, van der Schouw YT, Demerath EW, Wijmenga C, Timpson NJ, Reiner AP, North KE, Papanicolaou GJ, Hakonarson H, Lange LA*, Keating BJ*: Gene-centric meta-analyses of 108,912 individuals confirm known body mass index loci and reveal three novel signals. *Human Molecular Genetics* 22(1):184-201, 2013 January.

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黃冠華：**多重指標數據的統計分析**。*自然科學簡訊*，第二十四卷第三期，第 100 至 104 頁，民國 101 年 8 月。

Cheng CM, Chiu MJ, Wang JH, Liu HC, Shyu, YIL, **Huang GH**, Chen CCH*: Cognitive stimulation during hospitalization improves global cognition of older Taiwanese undergoing elective total knee and hip replacement. *Journal of Advanced Nursing* 68(6):1322-1329, 2012 June.

Schubert CR*, Cruickshanks KJ, Fischer ME, **Huang GH**, Klein BEK, Klein R, Pankow JS, Nondahl DM: Olfactory impairment in an adult population: The Beaver Dam Offspring Study. *Chemical Senses* 37(4):325-334, 2012 May.

Zhong W*, Cruickshanks KJ, **Huang GH**, Klein BEK, Klein R, Nieto FJ, Pankow JS, Schubert CR: Carotid atherosclerosis and cognitive function in midlife: The Beaver Dam Offspring Study. *Atherosclerosis* 219(1):330-333, 2011 November.

Zhan W*, Cruickshanks KJ, Klein BEK, Klein R, **Huang GH**, Pankow JS, Gangnon RE, Tweed TS: Modifiable determinants of hearing impairment in adults. *Preventive Medicine* 53(4-5):338-342, 2011 October.

Huang GH*, Wang SM, Hsu CC: Optimization-based model fitting for latent class and latent profile analyses. *Psychometrika* 76(4):584-611, 2011 October.

Huang GH, Tsai HH, Hwu HG*, Chen CH, Liu CC, Hua MS, Chen WJ: Patient subgroups of schizophrenia based on the Positive and Negative Syndrome Scale: composition and transition between acute and subsided disease states. *Comprehensive Psychiatry* 52(5):469-478, 2011 September-October.

Chen CCH*, Lin MT, Tien YW, Yen CJ, **Huang GH**, Inouye SK: Modified hospital elder life program: effects on abdominal surgery patients. *Journal of the American College of Surgeons* 213(2):245-252, 2011 August.

Chen CCH*, Yen CJ, Dai YT, Wang C, **Huang GH**: Prevalence of geriatric conditions: A hospital-wide survey of 455 geriatric inpatients in a tertiary medical center. *Archives of Gerontology and Geriatrics* 53(1):46-50, 2011 July-August.

Nash SD*, Cruickshanks KJ, Klein R, Klein BEK, Nieto FJ, **Huang GH**, Pankow JS, Tweed TS: The prevalence of hearing impairment and associated risk factors: the Beaver Dam Offspring Study. *Archives of Otolaryngology-Head & Neck Surgery* 137(5):432-439, 2011 May.

Nondahl D*, Cruickshanks KJ, **Huang GH**, Klein BEK, Klein R, Nieto FJ, Tweed TS: Tinnitus and its risk factors in the Beaver Dam Offspring Study. *International Journal of Audiology* 50(5):313-320, 2011 May.

Chen CCH, Chiu MJ, Chen SP, Cheng CM, **Huang GH***: Patterns of cognitive change in elderly patients during and six months after hospitalisation: a prospective cohort study. *International Journal of Nursing Studies* 48(3):338-346, 2011 March.

Huang LC, Hwang TJ*, **Huang GH**, Hwu HG: Outcome of severe obsessive-compulsive disorder with schizotypal features: a pilot study. *Journal of the Formosan Medical Association* 110(2):85-92, 2011 February.

Lanktree MB, Guo Y, Murtaza M, Glessner JT, Bailey SD, Onland-Moret NC, Lettre G, Ongen H, Rajagopalan R, Johnson T, Shen H, Nelson CP, Klopp N, Baumert J, Padmanabhan S,

Pankratz N, Pankow JS, Shah S, Taylor K, Barnard J, Peters BJ, M Maloney C, Lobmeyer MT, Stanton A, Zafarmand MH, Romaine SP, Mehta A, van Iperen EP, Gong Y, Price TS, Smith EN, Kim CE, Li YR, Asselbergs FW, Atwood LD, Bailey KM, Bhatt D, Bauer F, Behr ER, Bhangale T, Boer JM, Boehm BO, Bradfield JP, Brown M, Braund PS, Burton PR, Carty C, Chandrupatla HR, Chen W, Connell J, Dalgeorgou C, Boer AD, Drenos F, Elbers CC, Fang JC, Fox CS, Frackelton EC, Fuchs B, Furlong CE, Gibson Q, Gieger C, Goel A, Grobbee DE, Hastie C, Howard PJ, **Huang GH**, Johnson WC, Li Q, Kleber ME, Klein BE, Klein R, Kooperberg C, Ky B, Lacroix A, Lanken P, Lathrop M, Li M, Marshall V, Melander O, Mentch FD, J Meyer N, Monda KL, Montpetit A, Murugesan G, Nakayama K, Nondahl D, Onipinla A, Rafelt S, Newhouse SJ, Otieno FG, Patel SR, Putt ME, Rodriguez S, Safa RN, Sawyer DB, Schreiner PJ, Simpson C, Sivapalaratnam S, Srinivasan SR, Suver C, Swergold G, Sweitzer NK, Thomas KA, Thorand B, Timpson NJ, Tischfield S, Tobin M, Tomaszweski M, Verschuren WM, Wallace C, Winkelmann B, Zhang H, Zheng D, Zhang L, Zmuda JM, Clarke R, Balmforth AJ, Danesh J, Day IN, Schork NJ, de Bakker PI, Delles C, Duggan D, Hingorani AD, Hirschhorn JN, Hofker MH, Humphries SE, Kivimaki M, Lawlor DA, Kottke-Marchant K, Mega JL, Mitchell BD, Morrow DA, Palmen J, Redline S, Shields DC, Shuldiner AR, Sleiman PM, Smith GD, Farrall M, Jamshidi Y, Christiani DC, Casas JP, Hall AS, Doevendans PA, D Christie J, Berenson GS, Murray SS, Illig T, Dorn GW 2nd, Cappola TP, Boerwinkle E, Sever P, Rader DJ, Reilly MP, Caulfield M, Talmud PJ, Topol E, Engert JC, Wang K, Dominiczak A, Hamsten A, Curtis SP, Silverstein RL, Lange LA, Sabatine MS, Trip M, Saleheen D, Peden JF, Cruickshanks KJ, März W, O'Connell JR, Klungel OH, Wijmenga C, Maitland-van der Zee AH, Schadt EE, Johnson JA, Jarvik GP, Papanicolaou GJ; Hugh Watkins on behalf of PROCARDIS, Grant SF, Munroe PB, North KE, Samani NJ, Koenig W, Gaunt TR, Anand SS, van der Schouw YT; Meena Kumari on behalf of the Whitehall II Study the WHII 50K Group, Soranzo N, Fitzgerald GA, Reiner A, Hegele RA, Hakonarson H*, Keating BJ*: Meta-analysis of dense genecentric association studies reveals common and uncommon variants associated with height. *American Journal of Human Genetics* 88(1):6-18, 2011 January.

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Chen CCH*, Dai YT, Yen CJ, **Huang GH**, Wang C: Shared risk factors for distinct geriatric syndromes in older Taiwanese inpatients. *Nursing Research* 59(5):340-347, 2010 September-October.

Zhong W*, Cruickshanks KJ, Schubert CR, Nieto FJ, **Huang GH**, Klein BEK, Klein R: Obesity and depression symptoms in the Beaver Dam Offspring Study population. *Depression and Anxiety* 27(9):846-851, 2010 September.

Chen CCH*, Chang YC, **Huang GH**, Peng JH, Tseng CN: Persistent cognitive decline in older hospitalized patients in Taiwan. *Journal of Advanced Nursing* 66(9):1991-2001, 2010 September.

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Chen CCH***,** Tang ST, Wang C, **Huang GH**: Trajectory and determinants of nutritional health in older patients during and six-month post-hospitalization. *Journal of Clinical Nursing* 18(23):3299-3307, 2009 December.

Huang GH*, Hsieh CC, Chen CH, Chen WJ: Statistical validation of endophenotypes using a surrogate endpoint analytic analogue. *Genetic Epidemiology* 33(6):549-558, 2009 September.

Cruickshanks KJ*, Schubert CR, Snyder DJ, Bartoshuk LM, **Huang GH**, Klein BEK, Klein R, Nieto FJ, Pankow JS, Tweed TS, Krantz EM, Moy GS: Measuring taste impairment in epidemiologic studies: the Beaver Dam Offspring Study. *Annals of the New York Academy of Sciences* 1170:543-552, 2009 July.

Schubert CR*, Cruickshanks KJ, Murphy C, **Huang GH**, Klein BEK, Klein R, Nieto FJ, Pankow JS, Tweed TS: Olfactory impairment in adults: the Beaver Dam Experience. *Annals of the New York Academy of Sciences* 1170:531-536, 2009 July.

Krantz EM*, Schubert CR, Dalton DS, Zhong W, **Huang GH**, Klein BEK, Klein R, Nieto FJ, Cruickshanks KJ: Test-retest reliability of the San Diego Odor Identification Test and comparison with the Brief Smell Identification Test. *Chemical Senses* 34(5):435-440, 2009 June.

Huang GH*: Integrated analysis of incidence, progression, regression and disappearance probabilities. *BMC Medical Research Methodology* 8:40, 2008 June.

Chen CCH, Wang C, **Huang GH***: Functional trajectory six months post hospitalization: a cohort study of older hospitalized patients in Taiwan. *Nursing Research* 57(2):93-100, 2008 March-April.

Chen CCH**,** Bai YY, **Huang GH**, Tang ST*: Revisiting the concept of malnutrition in older people. *Journal of Clinical Nursing* 16(11):2015-2026, 2007 November.

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Huang GH*, Bandeen-Roche K: Building an identifiable latent class model with covariate effects on underlying and measured variables. *Psychometrika* 69(1):5-32, 2004 March.

Huang GH*, Palta M, Allen C, LeCaire T, D'Alessio D for the Wisconsin Diabetes Registry: Self-rated health among young people with type 1 diabetes in relation to risk factors in a longitudinal study. *American Journal of Epidemiology* 159(4):364-372, 2004 February.

Huang GH*, Klein R, Klein BEK, Tomany SC: Birth cohort effect on prevalence of age-related maculopathy in the Beaver Dam Eye Study. *American Journal of Epidemiology* 157(8):721-729, 2003 April.

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Grant Funding

"Deep learning based medical image analysis"
PI: Guan-Hua Huang (National Yang Ming Chiao Tung University)
Role: Principal investigator
Ministry of Science and Technology of Taiwan: 08/01/2022-07/31/2024

Medical imaging plays an essential role in the detection and diagnosis of numerous diseases. There has been a variety of research in computer-aided diagnosis of medical images to improve diagnostic efficiency and ensure high accuracy. The medical images containing huge amounts of physiological information are exactly what the data-hungry deep learning paradigms need to build valuable intelligent auxiliary systems. Applying deep learning methods to medical image analysis is very promising. Through the collaboration with the E-Da Hospital, I-Shou University, Taiwan, this project aims to analyze different types of medical imaging and use them for the application of image classification and object detection and segmentation.

"Detecting SNP-SNP interactions in drug sensitivity screens via endophenotypes"
PI: Guan-Hua Huang (National Chiao Tung University)
Role: Principal investigator
Ministry of Science and Technology of Taiwan: 08/01/2020-07/31/2022

A growing body of evidence has indicated that SNP-SNP interactions are probably ubiquitous in the drug responding mechanism. Most current studies of drug sensitivity analysis evaluate one SNP at a time. This simplified approach often fails to identify SNPs that are weakly related to the drug response by itself but can have a considerable impact on the variability of drug sensitivity when combined with other SNPs. This study advocates an approach involving endophenotypes to facilitate the identification of the effects of genetic interaction.

"The impact of psychological safety, adaptability, and inclusiveness on interprofessional collaboration – a longitudinal and intervention study"
PI: Angela Fan (National Yang-Ming University)
Role: Co-principal investigator
Ministry of Science and Technology of Taiwan: 08/01/2019-07/31/2020

This study aims to investigate the level and interactions of psychological safety, adaptability, and leader inclusiveness among medical students, physicians and other medical professionals including nursing, physical therapy, medical technology, and pharmacy students and colleagues with different grades and training stages. We will explore the interrelationship and timing of these factors, and to develop local intervention strategies by using the qualitative and quantitative analytical results and to test the efficacy of the intervention.

"Application of machine learning based experimental design in selecting optimal substrate cleaning conditions"
PI: Guan-Hua Huang (National Chiao Tung University)
Role: Principal investigator
Industrial Technology Research Institute: 01/01/2019-12/31/2019

This project will use automated optical inspection equipment to in-line measure the particle sizes on the substrate surface. We will present a hierarchical experimental design approach. Firstly, through the linear mixed effects model, the digital processing data collected from the cleaning machine are analyzed to find out the key factors that affect the particle removal rate. The established mixed effects model will also be used to estimate the remaining useful life of the cleaning material in order to replace the failed material in time. Then, using the machine learning based experimental design method (Bayesian optimization), under the condition of controlling the key factors affecting the particle removal rate, the optimal cleaning parameter setting is selected to achieve the purpose of speeding up the optimization time.

"Variable selection for high-dimensional latent class models"
PI: Guan-Hua Huang (National Chiao Tung University)
Role: Principal investigator
Ministry of Science and Technology of Taiwan: 08/01/2018-07/31/2020

Latent class models (LCMs) are widely used in analyzing multiple measured variables. In modern genomic research (e.g., high-throughput microarray and SNP array studies), a large number of variables are measured from moderate or small samples. Analysis of these high-dimensional data is difficult due to many noisy and overlapping features in such data, which can disturb the results. Thus, it is important to carry out some form of the variable selection made before or incorporated into the fitting procedure to exclude noisy and uninformative variables. In this project, we propose an "alternate k-means method" to identify these noisy variables and exclude their influences in LCMs.

"A study of the relationship among gender, leadership, and humane care in Taiwanese medical doctors"
PI: Angela Fan (National Yang-Ming University)
Role: Co-principal investigator
Ministry of Science and Technology of Taiwan: 08/01/2018-07/31/2019

This study aims to explore the factors that underlie the leadership and humane care of Taiwanese doctors. The humane care is mainly focus on the attitude towards patients suffering from discrimination and stigmatization. We will analyze the various influencing factors and do gender analysis. During the study, we plan to design local customized leadership and anti-stigma intervention training courses and evaluate the effectiveness of this interventional training.

"Develop Taiwanese competency based domains in system-based practice, interpersonal relationship and communication, and practice-based leaning and improvement - integration with emotional competence training"
PI: Angela Fan (National Yang-Ming University)
Role: Co-principal investigator
Ministry of Science and Technology of Taiwan: 08/01/2018-07/31/2019

This research aims to investigate the three core competencies, namely System-Based Practice, Interpersonal Relationship and Communication, and Practice-Based Leaning and Improvement. This study intends to lay emotional competency as the common groundwork for medical education and training of above core competencies and to investigate into emotional competence and its association with clinical core competencies. We plan to

develop local domains of competence as well as use the local data to design intervention on emotional competence.

"Establish the algorithm for serum biomarker BioFibroScore® to evaluate the efficacy of diagnosing liver fibrosis in patients with chronic hepatitis C, chronic hepatitis B, liver cancer and fatty liver"
PI: Yu-Chung Wei (Feng Chia University)
Role: Co-principal investigator
General Biologicals Corporation: 01/01/2018-12/31/2018

For patients with hepatitis C, hepatitis B, liver cancer and fatty liver, we use a variety of machine learning methods, including linear discriminant analysis, quadratic discriminant analysis, support vector machine, artificial neural network, and classification and regression tree, to establish the prediction model of protein concentration biomarkers (Fib A, Fib B, Fib C) on the liver fibrosis stages. We also evaluate the applicability of serum biomarkers in clinical diagnosis of liver fibrosis and tracking the development of liver disease.

"Screen and intervene: a diagnostic accuracy study and a randomized controlled trial for postextubation dysphagia"
PI: Cheryl Chia-Hui Chen (National Taiwan University)
Role: Co-principal investigator
Ministry of Science and Technology of Taiwan: 08/01/2017-07/31/2020

Endotracheal intubation is life-sustaining, but it may contribute to postextubation dysphagia (PED) increasing the risk of penetration, aspiration, and aspiration pneumonia. The aims of this three-year, two-stage study are: 1) to develop a two-step PED Screen involved oral stereognosis and cough reflex test for detecting penetration and aspiration, using a diagnostic accuracy study method; and 2) to test effects of a once daily, 7-day PED Care intervention on reducing time to resume oral intake, rates of penetration and intervention at 10 days postextubation, and incidences of 30-day aspiration pneumonia in adult patients with prolonged intubation (≥48 hours) from a medical center in Taiwan, using a randomized controlled trial (RCT) design.

"Detecting copy number variations from next-generation sequencing data via a Bayesian procedure"
PI: Guan-Hua Huang (National Chiao Tung University)
Role: Principal investigator
Ministry of Science and Technology of Taiwan: 08/01/2016-07/31/2018

Copy number variations (CNVs) are genomic structural mutations with abnormal gene fragment copies. Read depth signal mirrors the variants directly from the next generation sequencing. In this project, we develop a COpy Number variation detection tool by a BaYesian procedure, CONY, which adopts a hierarchical model and an efficient reversible jump Markov chain Monte Carlo inference algorithm for whole genome sequencing read depths data. Real data from the 1000 Genomes Project are analyzed. We also evaluate the performance of CONY and compare it with competing approaches via simulations.

"Effects of a "walk, eat & breathe" nursing intervention for patients with esophageal cancer: a randomized controlled trial"

PI: Cheryl Chia-Hui Chen (National Taiwan University)
Role: Co-principal investigator
Ministry of Science and Technology of Taiwan: 08/01/2016-07/31/2018

Esophageal cancer is a devastating disease with poor prognosis. To better support patients with esophageal cancer, during this critical treatment course (approximate 4 months in length), we develop a "Walk, Eat, & Breathe" nursing intervention consisting of nutritional advice, walking exercise, and inspiratory muscle training. The purpose of this stratified randomized controlled trial (RCT) is to test the effects of Walk, Eat, & Breathe on preserving patients' nutritional status, functional walking capacity, pulmonary function, and emotional well-being during the neoadjuvant chemoradiotherapy and surgery course.

"Burnout and resilience - a longitudinal and intervention study on medical students and physicians"
PI: Angela Fan (National Yang-Ming University)
Role: Co-principal investigator
National Science Council of Taiwan: 08/01/2016-07/31/2018

This study aims to investigate Taiwanese medical students and physicians in different years of school, training phase, medical professionalism, as well as burnout situation, causing of burnout, association and temporality of burnout and empathy in medical profession, and burnout resilience model. We will use the results of resilience research to create a local burnout prevention and intervention plan and test the efficacy of that plan.

"The study the differences of related clinical issues by analyzing & comparing e-data from NTUH and BJH"
PI: Guan-Hua Huang (National Chiao Tung University), Li-Kuei Chen (National Taiwan University Hospital)
Role: Principal investigator
National Chiao Tung University and National Taiwan University Hospital: 01/01/2016-12/31/2016

This project aims at using the e-data derived from both Barnes Jewish Hospital (BJH) and National Taiwan University Hospital (NTUH) for specific clinical topic researches (such as clinical path or SOP, standard of procedure) in the anesthesiology, orthopedics and ophthalmology. Through point to point thoroughly discussion in different departments, we can evaluate and analyze the differences in the procedures and outcomes from both sides and find out the key points to make the difference in the long round.

"Traffic flow prediction for freeway 5 in Taiwan"
PI: Henry Horng-Shing Lu (National Chiao Tung University)
Role: Co-principal investigator
China Engineering Consultants, Inc.: 12/01/2015-02/28/2017

Highway traffic congestion is a growing problem. This study is intended to use statistical methods to construct five traffic prediction models, respectively, for the long holiday, weekend, Monday/Friday, Tuesday to Thursday, and a single holiday. Traffic estimates arising can guide people to avoid traffic jams and also provide the traffic control center as a real-time traffic control strategy reference. Freeway No. 5's holiday, weekend or weekday peak traffic congestion condition and high detector layout density can provide a lot of traffic

information for analysis. Therefore, this study will use Freeway No. 5 as the scope of the study to develop and validate proposed traffic predictive models.

"Ensemble-based adaptive learning for remaining useful life (RUL) prediction of equipment components"
PI: Guan-Hua Huang (National Chiao Tung University)
Role: Principal investigator
Industrial Technology Research Institute: 12/01/2015-12/31/2016

This project will use some innovative statistical methods, such as nonparametric regression degradation model and ensemble-based adaptive learning, to predict the remaining useful life (RUL) of equipment components.

"A components-dependency based process parameters mining for equipment data"
PI: Guan-Hua Huang (National Chiao Tung University)
Role: Principal investigator
Industrial Technology Research Institute: 12/01/2014-12/31/2015

This project will use some innovative statistical methods, such as sparse principal component analysis and/or Bayesian clustering, to select important process parameters related to equipment component aging.

"In-depth research in latent class modeling"
PI: Guan-Hua Huang (National Chiao Tung University)
Role: Principal investigator
National Science Council of Taiwan: 08/01/2014-07/31/2016

I have devoted myself on the statistical methodological and theoretical research of latent class models, and all have obtained valuable results and excellent publications. However, there are many more important research topics and unsolved issues in latent class modeling. In this project, I aim to develop 1) methods for evaluating appropriateness of model assumptions underlying latent class analysis, 2) variable selection for high-dimensional latent class models, and 3) a general approach for establishing identifiability of parameters in latent class models. Solving these issues can guarantee the latent class models to extract true information underlying the data and can greatly benefit future medical research.

"Functional recovery after cardiac surgery for older patients: does delirium and calorie intake matter?"
PI: Cheryl Chia-Hui Chen (National Taiwan University)
Role: Co-principal investigator
National Science Council of Taiwan: 08/01/2013-07/31/2016

This cohort study aims to 1) describe the rates of 30-day surgical complication, functional decline, frailty, and one-year mortality for older patients underwent cardiac surgery; 2) delineate the trajectory of functional capacity 1 year after surgery for these patients; 3) test whether the trajectory of functional capacity varied significantly according to delirium status and its type over the one-year follow-up period; 4)examine patients' postsurgical actual caloric/protein/fluid intake in relation to the functional capacity within 3 months after surgery; and 5) evaluate whether activity levels, dietary diversity, and depressive symptoms at 3, 6, and 12 months affect patient outcomes.

"Analysis of professionalism cultivation in medical school training: the influence of empathy, medical humanities curriculum, and service learning on professionalism"
PI: Angela Fan (National Yang-Ming University)
Role: Co-principal investigator
National Science Council of Taiwan: 08/01/2013-07/31/2015

This study proposes to investigate the effects and interactions of various current medical education trainings, including medical humanities courses, service learning and the role of empathy in the process. As a multi-stage approach, we will assess medical students of six different groups and stages and at two time points with one-year apart in order to exam the kinds and lengths of the exposures of our interest. The selected measuring instruments will be assessed of their validity and reliability. Both quantitative and qualitative analyses will be conducted.

"A study on simulating realistic gene expression microarray data"
PI: Guan-Hua Huang (National Chiao Tung University)
Role: Principal investigator
National Science Council of Taiwan: 08/01/2012-07/31/2014

In this project, we plan to download publicly available raw data of the Affymetrix HG-U133A platform for various tissues from two public repositories: Gene Expression Omnibus and ArrayExpress. Then, an empirical approach is developed to determine the distribution of expression intensity for each gene, which can be used to simulate realistic gene expression data. To evaluate the proposed simulating approach, we will examine the distributions of housekeeping genes, compare the simulated and real gene expression data, and simulate gene expression intensities, which mimic the expression patterns shown in the HG-U133A tag spike-in dataset, to determine the sensitivity and specificity of various differential expression detecting methods.

"Swallowing and nutritional complications after endotracheal extubation: A study covers both whether and how"
PI: Cheryl Chia-Hui Chen (National Taiwan University)
Role: Co-principal investigator
National Science Council of Taiwan: 08/01/2012-07/31/2015

Because oral intake is an important component of patient recovery after critical illness, the aim of this study is to develop and evaluate an oral cognitive care protocol for the reduction of swallowing and nutritional complications in older patients after prolonged endotrachel intubation.

"Methods and strategies for discovering copy number variation with next-generation sequencing"
PI: Guan-Hua Huang (National Chiao Tung University), Shin-Yu Lin (National Taiwan University Hospital)
Role: Principal investigator
National Chiao Tung University and National Taiwan University Hospital: 01/01/2012-12/31/2012

This project aims at developing an integrated workflow that overcomes current computational and bioinformatics challenges for copy number variation (CNV) discovery using next-generation sequencing (NGS) data. We will apply the built CNV detection workflow to the NGS coupling with whole exome enrichment in the five cases collected from the National Taiwan University Hospital. It is hoped that this workflow is able to detect the microdeletion and small nucleotide changes, and it may provide an alternative and efficient tool for the genetic diagnosis of genetically heterogeneous diseases.

"Study of different medical education modes on the development of medical students' critical thinking"
PI: Angela Fan (National Yang-Ming University)
Role: Co-principal investigator
National Science Council of Taiwan: 08/01/2011-07/31/2013

This study proposes to investigate the effects and interactions of various current medical education trainings, including medical humanities courses, physician-scientist training, interview admissions, and internalization on medical students' critical thinking. As a multi-stage approach, we will assess medical students of four different stages and at two time points with one-year apart in order to exam the kinds and lengths of the exposures of our interest. The selected measuring instruments will be assessed of their validity and reliability. Both quantitative and qualitative analyses will be conducted.

"Gene expression microarray data simulator"
PI: Guan-Hua Huang (National Chiao Tung University)
Role: Principal investigator
National Science Council of Taiwan: 08/01/2011-07/31/2012

In this project, we plan to download publicly available raw data of the Affymetrix HG-U133A platform for various tissues from two public repositories: Gene Expression Omnibus and ArrayExpress. Then, an empirical approach is developed to determine the distribution of expression intensity for each gene, which can be used to simulate realistic gene expression data. This project attempts to use OpenMP and MPI parallel computing to reduce computing time when reprocessing the large amount of downloaded microarray raw data. We will compare the parallel efficiency of OpenMP and MPI in the high efficient personal workstation, the National Center for High-performance Computing and the Amazon EC2 cloud computing environment.

"Evaluation and planning for the training of scientific research and medical humanities in medical education"
PI: Angela Fan (National Yang-Ming University)
Role: Co-principal investigator
National Science Council of Taiwan: 08/01/2010-07/31/2011

This study examines the impact of different scientific research training routes and medical humanities courses on the research achievement and career status of medical doctors. We explore the interactions between scientific research training and medical humanities cultivation. We use this study to evaluate our current status while establish the local data base.

"Statistical methods for analyzing high-throughput genomic data"

PI: Guan-Hua Huang (National Chiao Tung University)
Role: Principal investigator
National Science Council of Taiwan: 08/01/2009-07/31/2011

The project focuses on two types of high-throughput data: gene expression microarray and single nucleotide polymorphism (SNP) markers. In gene expression microarray analysis, we evaluate combinations of the most popular preprocessing and differential expression methods in terms of validity and reliability. In the SNP marker analysis, we consider various SNP tagging criteria, haplotype block definitions and association tests, and develop methods to search for a set of marker loci in different genes and to analyze these loci jointly.

"Effects of oral care protocol on oral hygiene, swallowing ability, taste sensitivity, and nutritional status in older hospitalized patients who undergoing elective abdominal surgery"
PI: Cheryl Chia-Hui Chen (National Taiwan University)
Role: Co-principal investigator
National Science Council of Taiwan: 08/01/2009-07/31/2012

Oral health is an important contributor to the health and well-being. The aim of this study is to develop and evaluate a newly developed oral care protocol for the improvement of oral health and nutritional status in older patients who undergoing midline incision abdominal surgery during hospitalization and 8 weeks post surgery.

"Effects of a newly modified National Taiwan University Elder Life Program"
PI: Cheryl Chia-Hui Chen (National Taiwan University)
Role: Co-principal investigator
National Health Research Institutes of Taiwan: 01/01/2009- 12/31/2012

Three specific aims will be accomplished: (1) develop up-to-date evidence-based protocol books of the NTU-HELP core intervention, (2) conduct a single-blind, one-center, randomized controlled trial to test the effects of NTU-HELP, and (3) establish predictive models of functional decline and functional trajectory.

"National research program for genomic medicine: advanced bioinformatics core: genomic statistics for complex diseases"
PI: Chun-Houh Chen (Academia Sinica)
Role: Co-principal investigator
National Science Council of Taiwan: 05/01/2008-04/30/2011

The objective of this Genomic Statistics component project is to provide effective and integrative statistics related bioinformatics services to the NRPGM disease research projects and other core facilities, and to expand the services and research accomplishments to international biomedical researchers.

"Statistical validation and inferences of endophenotypes"
PI: Guan-Hua Huang (National Chiao Tung University)
Role: Principal investigator
National Science Council of Taiwan: 08/01/2007-07/31/2009

In this project, we propose to develop a formal statistical methodology for validating endophenotypes. Indices such as proportion of heritability explained, adjusted association

and relative heritability are used as operational criteria of validation. Besides, we provide relevant confidence intervals for these indices for making statistical inferences.

"The development of a hospital-based intervention program to prevent functional decline: a quasi-experimental study"
PI: Cheryl Chia-Hui Chen (National Taiwan University)
Role: Co-principal investigator
National Science Council of Taiwan: 08/01/2006-07/31/2009

The purpose of this 3-year study is to evaluate the feasibility of replicating and extending Yale-HELP in National Taiwan University Hospital and to pilot test the effectiveness of NTU-HELP in preventing common geriatric syndromes and minimizing functional decline in older patients.

"Bayesian inferences on latent class regression with an unknown number of components via reversible jump Markov chain Monte Carlo"
PI: Guan-Hua Huang (National Chiao Tung University)
Role: Principal investigator
National Science Council of Taiwan: 08/01/2005-07/31/2007

In this project, we propose to implement the reversible jump Markov chain Monte Carlo method to perform the joint estimation of the number of classes and model parameters of latent class models.

"A prospective study of cognitive, nutritional, and functional decline associated with hospitalization in older Taiwanese patient"
PI: Cheryl Chia-Hui Chen (National Taiwan University)
Role: Co-principal investigator
National Science Council of Taiwan: 08/01/2005-07/31/2006

The aim of this one-year prospective study is to examine the independent and interactive effects of acute illness on the course and magnitude of cognitive, nutritional, and functional decline in older Taiwanese patients.

"National research program for genomic medicine: advanced bioinformatics core for genomic statistics for complex diseases"
PI: Chun-Houh Chen (Academia Sinica)
Role: Co-principal investigator
National Science Council of Taiwan: 05/01/2005-04/30/2008

In the genomics statistics team for complex disease, we make efforts to develop effective statistical design/analysis methods via a comprehensive data management/analysis platform and provide statistical consulting services for the genomic research based on genotypes and clinical phenotypes by adjusting for the physiological and pathogenetic variations among study subject.

"National research program for genomic medicine: a study on risk mutations of vulnerability genes of schizophrenia"
PI: Hai-Gwo Hwu (National Taiwan University)
Role: Co-investigator

National Science Council of Taiwan: 05/01/2005-04/30/2008

The basic strategy of this project is to search for risk mutations, based on case-control design with sufficient statistical power, and then to validate these risk mutations by convergent evidence of genetic epidemiological analyses, functional variation studies using in vitro cell line experiments, microarray study, and neurophysiological study on mice model.

"Familial and birth cohort effects on the aging senses (I) & (II)"

PI: Karen J. Cruickshanks (University of Wisconsin-Madison)

Role: Co-investigator

National Institutes of Health, USA: 12/01/2004-11/30/2014

The purposes of this project are, among the post-World War II "baby-boom" generation, 1) to measure the prevalence of age-related sensory impairments (hearing, vision, olfaction) and subclinical disorders (cataract and age-related maculopathy), 2) to determine the association of subclinical vascular disease with sensory disorders, and 3) to evaluate birth cohort and familial effects on sensory impairments.

"Application of latent variable models in evaluating diagnostic tests and its software development"

PI: Guan-Hua Huang (National Chiao Tung University)

Role: Principal investigator

National Science Council of Taiwan: 12/01/2003-07/31/2005

In this project, we propose to extend the latent variable model to evaluate the validity and reliability of diagnostic tests. We also plan to incorporate all the latent variable methodologies developed so far into an easy-to-use statistical software capable of being used effectively by all levels of participants of data analysis.

"Epidemiology of age-related ocular disease"

PI: Ronald Klein (University of Wisconsin-Madison)

Role: Biostatistician

National Institutes of Health, USA: 10/01/2001 – 08/31/2003

The major goal of this project is to determine the long-term incidence and progression of the most common vision-threatening conditions of adult Americans, age-related maculopathy and cataract.

"Cohort registry of type 1 diabetes"

PI: Donn D'Alessio (University of Wisconsin-Madison)

Role: Biostatistician

National Institutes of Health, USA: 08/01/2000 – 09/29/2002

The major goal of this project is to establish retinopathy incidence change in urinary albumin excretion rate through the first 9 years of type 1 diabetes and their relationship to early risk factors.

Invited Presentations in the International Conferences

“Deep convolutional neural networks for multi-class classification of three dimensional brain images.” The 31th South Taiwan Statistics Conference, Feng Chia University, Taichung, Taiwan (July 28-29, 2022).

“Machine learning classification of functional brain imaging for Parkinson’s disease stage prediction.” The 6th International Conference on Soft Computing in Data Science 2021 (SCDS2021), Keynote speaker of the online conference hosted by Universiti Teknologi MARA (UiTM) Malaysi, and Institut Teknologi Sepuluh Nopember (ITS) Indonesia (November 2-3, 2021)

“Multi-label deep learning classification of chest x-rays.” The 30th South Taiwan Statistics Conference, National University of Kaohsiung, Kaohsiung, Taiwan (October 30-31, 2021).

“Non-invasive biosensing and bio-intelligence.” The International Conference on Emergent Functional Matter Science 2020, Yilan, Taiwan (December 10-11, 2020).

“利用機器學習在功能性腦部影像上進行帕金森氏症分期預測” 2020 年公共衛生聯合年會，國立臺灣師範大學、台北市、台灣（2020 年 10 月 17 日）。

“Multi-label deep learning classification of chest x-rays.” The 29th South Taiwan Statistics Conference, National Chung Cheng University, Chiayi, Taiwan (August 20-21, 2020).

“Machine learning classification of functional brain imaging for Parkinson’s disease stage prediction.” The 25th Macroeconometric Modelling Workshop (MMW), Academia Sinica, Taipei, Taiwan (December 5-6, 2019).

“Machine learning classification of functional brain imaging for Parkinson’s disease stage prediction.” Data Science, Statistics & Visualisation 2019 Conference, Kyoto, Japan (August 13-15, 2019).

“Machine learning classification of functional brain imaging for Parkinson’s disease stage prediction.” The 3rd International Conference on Econometrics and Statistics (EcoSta 2019), Taichung, Taiwan (June 25-27, 2019).

“Machine learning classification for hyper-parameter selection in latent class regression models.” The 28th South Taiwan Statistics Conference, National Chung Hsing University, Taichung, Taiwan (June 21-22, 2019).

“Detecting copy number variations from next-generation sequencing data via a Bayesian procedure.” 2017 ICSA Applied Statistics Symposium, Chicago, USA (June 25-28, 2017).

“Using regression extension of latent class models for traffic flow prediction.” The 26th South Taiwan Statistics Conference, National Taipei University, New Taipei City, Taiwan (June 23-24, 2017).

"Statistical analytic approaches for prognostics and health management of equipment data." The 2016 Annual Meeting of Chinese Statistical Society and International Statistical Conference, National Chengchi University, Taipei, Taiwan (December 9, 2016).

"Detecting copy number variations from next-generation sequencing data via a Bayesian procedure." International Conference on Theoretical and Applied Statistics, Institut Teknologi Sepuluh Nopember, Indonesia (October 19-20, 2016).

"Detecting gene-gene interactions in high-throughput genotype data through a Bayesian clustering procedure." 2015 International Symposium on Statistical Genetics, Seoul National University, Korea (May 27-28, 2015).

"Detecting gene-gene interactions in high-throughput genotype data through a Bayesian clustering procedure." Konferensi Nasional Matematika (KNM) XVII, Institut Teknologi Sepuluh Nopember, Indonesia (June 9-12, 2014).

"Genotype imputation accuracy with different reference panels in admixed populations." The 22th South Taiwan Statistics Conference, National University of Kaohsiung, Kaohsiung, Taiwan (June 28-29, 2013).

"Detecting gene-gene interactions in high-throughput genotype data through a Bayesian clustering procedure." The 6th UST-UCSD Bilateral Symposium, University of California, San Diego, La Jolla, CA, USA (November 19-20, 2012).

"Genotype imputation accuracy with different reference panels." Genetic Analysis Workshop 18, Stevenson, Washington, USA (October 14-17, 2012).

"A Bayesian clustering approach for detecting gene-gene interactions in high-dimensional genotype data." The 8th Across-Strait Conference on Probability and Statistics, Harbin, China (August 14-16, 2012).

"Detecting gene-environment and gene-gene interactions through endophenotypes." The 20th South Taiwan Statistics Conference, National Chung Cheng University, Chiayi, Taiwan (June 24-25, 2011).

"Optimization-based model fitting for latent class and latent profile analyses." The 2010 Annual Meeting of Chinese Statistical Society and International Statistical Conference, National Central University, Jhongli, Taiwan (December 16-17, 2010).

"Detecting gene-environment and gene-gene interactions through endophenotypes." Genetic Analysis Workshop 17, Cambridge, Massachusetts, USA (October 13-16, 2010).

"Gene expression microarray data generator using a reference training set from publicly available databases." NCTS International Conference on Probability and Statistics with Applications in Biology, Hsinchu, Taiwan (July 14-16, 2010)

"Prediction of underlying latent classes via k-means and hierarchical clustering algorithm." The 19th South Taiwan Statistics Conference, National Cheng Kung University, Tainan, Taiwan (July 6-7, 2010).

"Statistical validation of endophenotypes using a surrogate endpoint analytic analogue (poster)." The Genomics of Common Diseases 2009, Wellcome Trust Genome Campus, Hinxton, Cambridge, UK (September 17-22, 2009).

"Comparison of five commonly used gene-gene interaction detecting methods in schizophrenia." The 18th South Taiwan Statistics Conference, National Sun Yat-sen University, Kaohsiung, Taiwan (June 26-27, 2009).

"Recent development in microarray data analysis." Recent Development in Biostatistical Research, National Health Research Institutes, Taipei, Taiwan (November 22, 2008).

"Statistical validation of endophenotypes using a surrogate endpoint analytic analogue." International Meeting of the Psychometric Society, Tokyo, Japan (July 9-13, 2007).

"Statistical validation of endophenotypes using a surrogate endpoint analytic analogue." Symposium on Recent Development of Statistics in Biological Sciences, National Health Research Institutes, Zhunan, Taiwan (June 28-29, 2007).

Teaching Experiences

Institute of Statistics, National Yang Ming Chiao Tung University

Spring 2023
Multivariate Analysis

Fall 2022
Deep learning in medical image analysis

Spring 2022
Multivariate Analysis

Fall 2021
Biostatistics

Spring 2021
Deep learning in medical image analysis
Multivariate Analysis

Fall 2020
Analysis of high-throughput genomic data

Spring 2020
Multivariate Analysis

Special Topics in Latent Class Modeling

Fall 2019
Biostatistics

Spring 2018
Multivariate Analysis
Statistical Computing

Fall 2017
Data science, Statistics and R

Spring 2017
Multivariate Analysis
Longitudinal Data Analysis

Fall 2016
Regression Analysis
Statistical Methods

Spring 2016
Multivariate Analysis

Fall 2015
Regression Analysis

Spring 2015
Multivariate Analysis
Longitudinal Data Analysis

Fall 2014
Regression Analysis
Big data analysis in practice

Spring 2014
Statistical Computing

Fall 2013
Regression Analysis

Spring 2013
Statistical Computing

Fall 2012
Longitudinal Data Analysis

Spring 2012
Analysis of High-throughput Genomic Data: Expression and SNP

Fall 2011
Statistical Methods for Epidemiology
Multivariate Analysis

Spring 2011
Analysis of High-throughput Genomic Data: Expression and SNP

Fall 2010
Multivariate Analysis
Generalized Linear (and Additive) Models

Spring 2010
Statistical Methods for Epidemiology

Fall 2009
Generalized Linear (and Additive) Models

Spring 2009
Analysis of High-throughput Genomic Data: Expression and SNP
Statistical Methods for Epidemiology

Fall 2008
Multivariate Analysis

Spring 2008
Analysis of High-throughput Genomic Data: Expression and SNP
Statistical Methods for Epidemiology

Fall 2007
Introduction to Epidemiology
Multivariate Analysis

Spring 2007
Generalized Linear Models
Statistical Methods for Epidemiology

Fall 2006
Multivariate Analysis
Statistics

Spring 2006
Statistical Consulting
Statistical Methods for Epidemiology

Fall 2005
Introduction to Epidemiology

Spring 2005
Linear Models
Statistical Methods for Epidemiology

Fall 2004
Introduction to Epidemiology
Statistics

Spring 2004
Linear Models
Statistical Methods for Epidemiology

Fall 2003
Introduction to Epidemiology

Department of Population Health Sciences, University of Wisconsin-Madison

Spring 2003
Quantitative Methods in Population Health I

Fall 2002
Introduction to Quantitative Methods-Population Health

Spring 2002
Quantitative Methods in Population Health I

Fall 2001
Introduction to Quantitative Methods-Population Health

Fall 2000
Introduction to Quantitative Methods-Population Health