Statistics Group at Peking University

Wei Lin

School of Mathematical Sciences
Center for Statistical Science
Peking University

The University of Melbourne
August 26, 2015

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History of the Statistics Group at PKU

► Research and teaching in statistics started at PKU

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  - Pao-Lu Hsu appointed as Professor of Mathematics in 1940

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  - ▶ A seminar on limit theory run in the early 1950s

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- *Division of Probability and Statistics* established in 1956

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  - ▶ Pao-Lu Hsu as the founding director

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  - Following the pattern of the Moscow State University

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- ► *Division of Probability and Statistics* established in 1956
  - ► Pao-Lu Hsu as the founding director
  - ► Following the pattern of the Moscow State University
  - ► First class consisting of more than 50 students and a few instructors from three universities

History of the Statistics Group at PKU

► Turned into the *Department of Probability and Statistics* in 1985

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  - 39 faculty and staff members at its peak

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  - Zhi Geng as the new department chair

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    - Zhi Geng as the new department chair
    - *Department of Financial Mathematics* established within the school, with some faculty members from the department

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History of the Statistics Group at PKU

- *Center for Statistical Science* established in 2010

History of the Statistics Group at PKU

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  - Succeeding the *Institute of Mathematical Statistics*

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- *Center for Statistical Science* established in 2010
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- Coordinating statistical research efforts across campus

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  - *Department of Probability and Statistics* and *Department of Financial Mathematics* in the *School of Mathematical Sciences*

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  - *Department of Probability and Statistics* and *Department of Financial Mathematics* in the *School of Mathematical Sciences*
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  - *School of Life Sciences*, *School of Public Health*, etc.

Father of Probability and Statistics in China
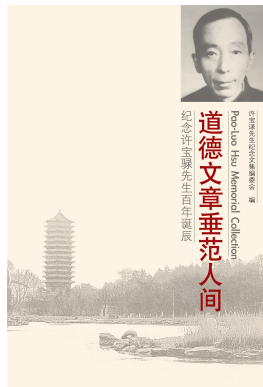
Pao-Lu Hsu (1910–1970)

Father of Probability and Statistics in China

▶ Website: www.math.pku.edu.cn/teachers/Hsu/

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- ► Website: www.math.pku.edu.cn/teachers/Hsu/
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  - ▶ Tsinghua University Pao-Lu Hsu Lecture since 2011
  - ▶ Pao-Lu Hsu Award presented every three years by ICSA:
    Jianqing Fan, Xiao-Li Meng and Bin Yu (2012)

Faculty, Postdocs, and Students

► Faculty members joining before 2010:
Xiangzhong Fang (Department Chair), Mingyao Ai (Group Director),
Minghua Deng, Zhi Geng, Dongfeng Li, Liping Liu, Junshan Shen,
Wanlong Sun, Yuan Yao
Song Xi Chen (Guanghua), Hansheng Wang (Guanghua)

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- ► Recent faculty recruitments through the Center:
  Jinzhu Jia (2011), Ruibin Xi (2012), Hui Huang (2013), Wei Lin (2014)
  Yundong Tu (2012, Guanghua), Xiaojun Song (2014, Guanghua)
  Cheng Li (2013, Life Sciences)

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► Postdocs: currently none

► Students: about 10 Ph.D. students, 30 Master of Applied Statistics
students, and 40 undergraduate majors each year

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Faculty Research Interests

- Causal inference: Zhi Geng, Jinzhu Jia, Wei Lin

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- Network analysis: Zhi Geng, Minghua Deng, Jinzhu Jia, Wei Lin, Hansheng Wang, Yuan Yao

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- Network analysis: Zhi Geng, Minghua Deng, Jinzhu Jia, Wei Lin, Hansheng Wang, Yuan Yao
- Spatial and functional data analysis: Hui Huang

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- ▶ Spatial and functional data analysis: Hui Huang

- ▶ Statistical software: Dongfeng Li

Song Xi Chen, *Professor*

► Ph.D., Australian National University, 1993

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- ► Research interests: inference for high dimensional data, inference for stochastic processes, multiple system surveys for US Census, empirical likelihood, analysis on missing data

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- ▶ Associate Editor of *Annals of Statistics* and *Journal of Business and Economic Statistics*

Song Xi Chen, *Professor*

h-index 22, i10-Index 36, average citations per article 16.7

Recent publications

- ► Qiu, Y. and Chen, S.X. (2015). Band width selection for high dimensional covariance matrix estimation. *J. Amer. Statist. Assoc.*, to appear.

- ► Chang, J., Chen, S. X. and Chen, X. (2015). High dimensional generalized empirical likelihood for moment restrictions with dependent data. *J. Economet.*, 185, 283–304.

- ► Zhong, P.-S., Chen, S. X. and Xu, M. (2013). Tests alternative to higher criticism for high dimensional means under sparsity and column-wise dependence, *Ann. Statist.*, 41, 2820–2851.
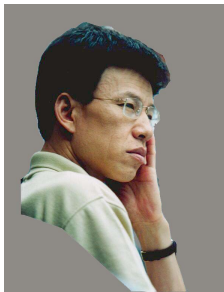
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Zhi Geng, *Professor*

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- ▶ Chair of IMS China
- ▶ Associate Editor of *CSDA* and *Statistica Sinica*

Zhi Geng, *Professor*

Recent publications

► Ding, P. and Geng, Z. (2014). Identifiability of subgroup causal effects in randomized experiments with nonignorable missing covariates. *Statist. Med.*, 33, 1121–1133.

► Deng, K., Geng, Z. and Liu, J. S. (2014). Association pattern discovery via theme dictionary models. *J. R. Statist. Soc. Ser. B*, 76, 319–347.

► Deng, W., Geng, Z. and Li, H. (2013). Learning local directed acyclic graphs based on multivariate time series data. *Ann. Appl. Statist.*, 7, 1663–1683.

Hansheng Wang, *Professor*

► Ph.D., University of Wisconsin-Madison, 2001

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- ▶ Ph.D., University of Wisconsin-Madison, 2001
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- ▶ Fellow of ASA
- ▶ Associate Editor of *AOS*, *JASA*, *JBES*, *CSDA*, etc.

Hansheng Wang, *Professor*

Recent publications

- ▶ Huang, D., Yin, J., Shi, T. and Wang, H. (2015). A statistical model for social network labeling. *JBES*, to appear.

- ▶ Pan, R., Wang, H. and Li, R. (2015). Ultrahigh dimensional multi-class linear discriminant analysis by pairwise sure independence screening. *JASA*, to appear.

- ▶ Lan, W., Luo, R., Tsai, C.-L., Wang, H. and Yang, Y. (2015). Testing the diagonality of a large covariance matrix in a regression setting, *JBES*, 33, 76–86.

Mingyao Ai, *Professor*

► Ph.D., Nankai University, 2003

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Mingyao Ai, *Professor*

Recent publications

- ▶ Ai, M., Kong, X. and Li, K. (2015). A general theory for orthogonal array based Latin hypercube designs. *Statistica Sinica*, to appear.
- ▶ Li, K., Zheng, W. and Ai, M. (2015). Optimal designs for the proportional interference model. *Ann. Statist.*, 43, 1596–1616.
- ▶ Qian, Peter Z. G., Ai, M., Hwang, Y. and Su, H. (2014). Asymmetric nested lattice samples. *Technometrics* 56, 46–54.

Minghua Deng, *Professor*

► Ph.D., Peking University, 1998

Minghua Deng, *Professor*

- ► Ph.D., Peking University, 1998
- ► Research interests: DNA sequence analysis, preprocessing of gene chip data, gene expression data analysis, gene regulatory network analysis, association study, eQTL data analysis

Minghua Deng, *Professor*

Recent publications

- ▶ Chen, J.-Y. et al. (2014). RNA editome in rhesus macaque shaped by purifying selection. *PLoS Genet.*, 10, e1004274.
- ▶ Ren, J. et al. (2013). Multiple alignment-free sequence comparison. *Bioinformatics*, 29, 2690–2698.
- ▶ Wang, L., Zheng, W., Zhao, H. and Deng, M. (2013). Statistical analysis reveals co-expression patterns of many pairs of genes in yeast are jointly regulated by interacting loci. *PLoS Genet.*, 9, e1003414.

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- ▶ Research interests: survival analysis and reliability theory

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Xiangzhong Fang, *Professor*

- ▶ Ph.D., Peking University, 1996
- ▶ Research interests: survival analysis and reliability theory
- ▶ Took charge of the research project on the reliability and safety evaluation system for CZ-2F Rocket, which was a part of the spacecraft program of China

Liping Liu, *Professor*

- Ph.D., University of Oslo, 1997

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- ▶ Ph.D., University of Oslo, 1997
- ▶ Research interests: survival analysis, capture-recapture
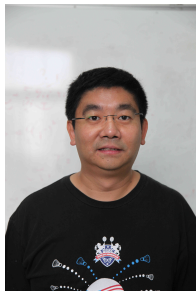
Yuan Yao, *Associate Professor*
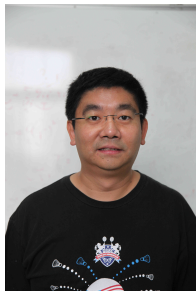
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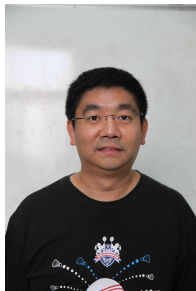
- ▶ Ph.D., UC Berkeley, 2006
- ▶ Postdoc, Stanford University, 2006–2009

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- ▶ Postdoc, Stanford University, 2006–2009
- ▶ Research interests: online learning algorithms, statistical machine learning, topological and geometrical methods in data analysis

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Yuan Yao, *Associate Professor*

Recent publications

- ▶ Tarres, P. and Yao, Y. (2014). online learning as stochastic approximations of regularization paths: optimality and almost-sure convergence. *IEEE Trans. Information Theory*, 60, 5716–5735.

- ▶ Xu, Q., Xiong, J., Huang, Q. and Yao, Y. (2014). Online HodgeRank on random graphs for crowdsourceable QoE evaluation. *IEEE Trans. Multimedia*, 16, 373–386.

- ▶ Jiang, X., Yao, Y., Liu, H. and Guibas, L. (2014). Compressive network analysis. *IEEE Trans. Automatic Control*, 59, 2946–2961.
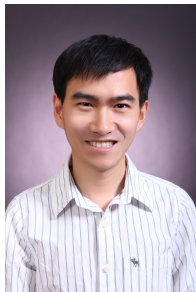
Jinzhu Jia, *Assistant Professor*

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Jinzhu Jia, *Assistant Professor*

- ► Ph.D., Peking University, 2009
- ► Postdoc, UC Berkeley, 2009–2010
- ► Research interests: high dimensional data analysis, statistical machine learning, graphical models, text analysis

Jinzhu Jia, *Assistant Professor*

Recent publications

- Jia, J. and Rohe, K. (2015). Preconditioning the Lasso for sign consistency. *Electron. J. Statist.*, 9, 1150–1172.
- Jia, J., Miratrix, L., Yu, B., Gawalt, B., El Ghaoui, L., Barnesmoore, L. and Clavier, S. (2014). Concise comparative summaries (CCS) of large text corpora with a human experiment. *Ann. Appl. Statist.*, 8, 499–529.
- He, Y., Jia, J. and Yu, B. (2013). Reversible MCMC on Markov equivalence classes of sparse directed acyclic graphs. *Ann. Statist.*, 41, 1742–1779.

Ruibin Xi, *Assistant Professor*

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- ► Ph.D., Washington University in St. Louis, 2009
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- ► The Recruitment Program of Global Experts for Young Scholars, 2013

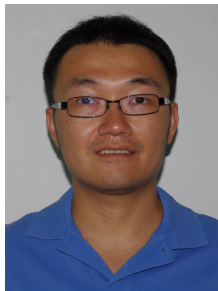# Ruibin Xi, *Assistant Professor*

Recent publications

- ▶ Yang, L., Luquette, L. J., Gehlenborg, N., Xi, R. et al. (2013). Diverse mechanisms of somatic structural variations in human cancer genomes. *Cell*, 153, 919–929.

- ▶ Kim, T. M., Xi, R., Luquette, L. J., Park, R. W., Johnson, M.D. and Park, P. J. (2013). Functional genomic analysis of chromosomal aberrations in a compendium of 8000 cancer genomes. *Genome Research*, 23, 217–227.

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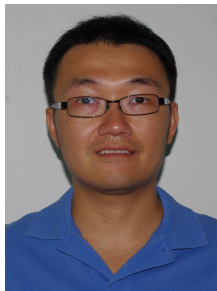
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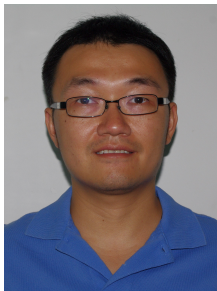
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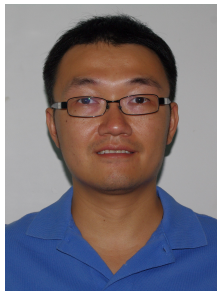
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Recent publications

- ► Huang, H., Li, Y. and Guan, Y. (2014). Joint modeling and clustering of paired generalized longitudinal processes in cocaine dependent treatment data. *J. Amer. Statist. Assoc.*, 109, 1412–1424.
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Recent publications

- ▶ Lin, W., Feng, R. and Li, H. (2015). Regularization methods for high-dimensional instrumental variables regression with an application to genetical genomics. *J. Amer. Statist. Assoc.*, 110, 270–288.
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