

## CURRICULUM VITAE

Xiangtao Liu, PhD

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### Research Areas:

Metagenomics, cancer genomics, epigenomics, genetics and biomarker discovery, machine learning methods, and biostatistics

### Education:

- 2010 PhD in Applied Mathematics, Yale University, USA  
2003 MS in Particle and Nuclear Physics, Peking University, P. R. China  
2000 BS in Nuclear Physics and Nuclear Technology, Peking University, P. R. China

### Experience:

- 10/2017 – present Research Scientist, University of Kansas, Dept of EECS  
05/2017 – 09/2021 Chief Scientist, Tianjia Genomes Tech Co., Ltd., Hefei, Anhui, China  
04/2016 – 04/2017 Chief Technology Officer, Cipher Gene LLC, Beijing, China  
06/2014 – 04/2016 Associate Research Scientist, University of Iowa, Dept. of Psychiatry. PIs: Shizhong Han, Samuel Kuperman  
09/2012 – 05/2014 Postdoctoral Researcher, The Ohio State University, Comprehensive Cancer Center & Dept. of Statistics. PIs: Qianben Wang, Shili Lin  
06/2011 – 09/2012 Postdoctoral Associate, Yale School of Medicine, Dept. of Psychiatry, Human Genetics Division. PI: Joel Gelernter  
04/2011 – 05/2011 Research Associate, Yale School of Public Health, Emerging Infections Program  
08/2006 – 12/2010 Research Assistant, Yale School of Public Health. PI: Josephine Hoh  
07/2007 – 09/2007 Statistics Intern, Purdue Pharma L. P., Stamford, CT, USA. Supervisor: Stephen Harris  
06/2006 – 08/2006 Rotation student, Yale Dept. of Molecular Biophysics and Biochemistry & Dept. of Computer Science, PI: Mark Gerstein

- 09/2004 – 05/2006 Research Assistant, Yale Dept. of Mathematics. Supervisor: Vladimir Rokhlin
- 07/2003 – 08/2004 Research Assistant, Chinese Academy of Science, Institute of Computational Mathematics & Scientific/Engineering Computing. Supervisor: Yifa Tang
- 09/2001 – 06/2003 Research Assistant, Peking University, School of Physics, Dept. of Technical Physics. Supervisor: Qiren Zhang

### **Honors and affiliations:**

- 12/2020 – Senior title of Researcher (full professor) in Bioinformatics, Tianjia Genomes Tech Co., Ltd.
- 12/2018 – Off-Campus Practice Mentor for master students in College of Pharmacy, Anhui Medical University
- 2019 – Mentor for master students major in Biology & Medicine, College of Life Sciences, Anhui Normal University
- 2018 – 2020 External expert of Anhui High-tech Industry Investment Co., Ltd.
- 2018 – Distinguished Expert, Anhui Province

### **Grants and Funds:**

- 2020 – 2021 Hefei municipal team in science and technology, “Study on precision medicine of lung cancer radiotherapy based on big genomic data”, **Lead Investigator**
- 2019 – 2021 Guangzhou municipal Red Cotton Plan, “The R&D and industrialization of precision radiotherapy based on genetic testing”, **PI**
- 2019 – 2021 Public bidding project, “Study on the genetic map of ischemic cerebrovascular diseases in China, Bioinformatics Analysis Service Package”, by Capital Medical University Advanced Innovation Center for Human Brain Protection, **contract PI**
- 2014 – 2019 U10- AA008401, “The Collaborative Study on the Genetics of Alcoholism”, **Statistician**
- 2014 – 2016 R01-AA022994, “Fine mapping a gene subnetwork underlying alcohol dependence”, **Associate Research Scientist**
- 2011 – 2012 R01-DA030976, “Deep sequencing studies for cannabis and stimulant dependence”, **Postdoctoral Associate**

- 2011 – 2012 RC2-DA028909, “Genomewide association study of cocaine dependence in two populations”, **Postdoctoral Associate**
- 2006 – 2010 Non-Federal Fund, “Genome-wide linkage disequilibrium mapping for carcinoid susceptibility genes”, **Doctoral Student**
- 2006 – 2010 R21-DA028909, “CFH-independent risk factors in age-related macular degeneration”, **Doctoral Student**

**Mentoring and teaching:**

- 05/2021 Corporate Mentor, University of Science and Technology of China, Department of Precision Machinery and Precision Instruments, reviewer of master's thesis by Peng Dou
- 06/2017 Corporate Mentor, University of Science and Technology of China, Department of Precision Machinery and Precision Instruments, for master's thesis defenses by Zuhua Zhao, Dengling Xie, Zeshu Zhang
- 12/2016 Corporate Mentor, Tianjin University, School of Computer Science and Technology, for master's thesis by Zhao Li
- 2007 – 2010 Teaching Assistant, Yale University, for Introduction to Quantitative Thinking, Introductory Statistics, Probability & Statistics, Probability Theory, Stochastic Processes
- 2002 Teaching Assistant, Peking University, for College Physics II, Nuclear Physics

**Membership:**

- 2014 – 2019 The American Society of Human Genetics
- 2009 – Sino-American Pharmaceutical Professionals Association
- 2008 – 2017 American Statistical Association
- 2009 –2011 Institute of Mathematical Statistics  
International Biometrics Society, ENAR
- 2006 – 2009 American Association for the Advancement of Science

**Professional services:**

Invited Expert for evaluation of “Provincial High-Level Talent Team in Science and Technology” in Anhui, “Luzhou Industrial Innovation Team” in Hefei, Jingde Health Industry Fund Management Team by Anhui High-tech Industry

Investment Co., Ltd.

Invited Reviewer for *AMIA 2019, 2018,2017 Annual Symposium, Wellcome Open Research, PSB 2016, ICIBM 2015* conferences, *Nucleic Acids Research, Scientific Reports, BMC Medical Genomics, Crop Science, IEEE ACM Transactions on Computational Biology and Bioinformatics, PeerJ, Journal of Applied Mathematics and Physics, Open Journal of Genetics, Open Journal of Statistics, PLoS One, Int. J. Model. Simul. Sci. Comput.*

**Journal papers (<https://scholar.google.com/citations?user=88LRDCsAAAAJ&hl=en>):**

1. Yu B, Chen L, Zhang W, Li Y, Zhang Y, Gao Y, Teng X, Zou L, Wang Q, Jia H, **Liu X**, Zheng H, Hou P, Yu H, Sun Y, Zhang Z, Zhang P, Zhang L (2020). TOP2A and CENPF are synergistic master regulators activated in cervical cancer. *BMC Medical Genomics*. 13 (1), 1-17.
2. Du L, Ma N, Dai X, Yu W, Huang X, Xu S, Liu F, He Q, Liu Y, Wang Q, **Liu X**, Zheng H, Qu B (2020). Precise prediction of the radiation pneumonitis in lung cancer: an explorative preliminary mathematical model using genotype information. *Journal of Cancer*. 11 (8), 2329. DOI: 10.7150/jca.37708.
3. Shen H-W, Chai H, Xia L-Y, Wu S-B, Qu W, Liang Y, **Liu X-T** (2020). A greedy screening test strategy to accelerate solving LASSO problems with small regularization parameters. *Soft Computing*. 24 (7), 5245-5253. DOI: 10.1007/s00500-019-04275-x.
4. Acion L, Kramer J, **Liu X**, Chan G, Langbehn D, Bucholz K, McCutcheon V, Hesselbrock V, Schuckit M, Dick D, Hesselbrock M, Kuperman S (2019). Reliability and validity of an internalizing symptom scale based on the adolescent and adult Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA). *The American journal of drug and alcohol abuse*. 45 (2), 151-160. DOI: 10.1080/00952990.2018.1476520.
5. Xing X, Jia S, Wu J, Feng Q, Dong B, Li B, Jia Y, Shan F, Li Y, Zhang Y, Hu Y, Wang X, **Liu X**, Yu S, Zhang L, Bu Z, Wu A, Li Z, Ji J (2017). Clonality analysis of synchronous gastroesophageal junction carcinoma and distal gastric cancer by whole-exome sequencing. *J Pathol*. 243 (2), 165-175. DOI: 10.1002/path.4932.
6. Kuperman S, Foroud T, Chan G, Kramer JR, Wetherill L, Acion L, Edenberg HJ, Nurnberger J, Agrawal A, Anokhin A, Brooks A, Hesselbrock V, Hesselbrock M, Schuckit M, Tischfield J, **Liu X** (2017). A GABRA2 Polymorphism Improves a Model for the Likelihood of Alcohol Initiation. *Alcohol* 63 1-8.

7. Zhu Z, Yao Z, Shen X, Chen Z, **Liu X**, Parquette JR, Liu S (2017). Oligothiophene compounds inhibit the membrane fusion between H5N1 avian influenza virus and the endosome of host cell. *Eur. J. Med. Chem.* 130:185-194. DOI: 10.1016/j.ejmech.2017.02.040.
8. Zhao Y, Chen P, Bu W, **Liu X**, Tang Y (2017). Two Mixed Finite Element Methods for Time-Fractional Diffusion Equations. *J. Sci. Comput.* 70 (1), 407-428. DOI: 10.1007/s10915-015-0152-y.
9. **Liu X**, Yu P, Chen C, Potash JB, Han S (2016). GLITTER: a web-based application for gene link inspection through tissue-specific coexpression. *Scientific Reports.* 6 (1), 1-5. DOI: 10.1038/srep33460.
10. Huang J, Wang K, Wei P, **Liu X**, Liu X, Tan K, Boerwinkle E, Potash JB, Han S (2016). A flexible and adaptive association test for gene sets using summary statistics. *Genetics.* 202 (3), 919-929. DOI: 10.1534/genetics.115.185009.
11. Sunkel B, Wu D, Chen Z, Wang C-M, **Liu X**, Ye Z, Horning AM, Liu J, Mahalingam D, Lopez-Nicora H, Lin C-L, Goodfellow PJ, Clinton SK, Jin VX, Chen C-L, Huang TH-M, Wang Q (2016). Integrative analysis identifies targetable CREB1/FoxA1 transcriptional co-regulation as a predictor of prostate cancer recurrence. *Nucl. Acids Res.* 44 (9), 4105-4122. DOI: 10.1093/nar/gkv1528.
12. Bu W, **Liu X**, Tang Y, Yang J (2015). Finite element multigrid method for multi-term time fractional advection diffusion equations. *Int. J. Model. Simul. Sci. Comput.* 6, DOI: 10.1142/S1793962315400012.
13. Chen Z, Lan X, Thomas-Ahner JM, Wu D, **Liu X**, Ye Z, Wang L, Sunkel B, Grenade C, Chen J, Zynger DL, Yan PS, Nephew KP, Huang THM, Lin S, Clinton SK, Li W, Jin VX, Wang Q (2014). Agonist and Antagonist Switch DNA Motifs Recognized by Human Androgen Receptor in Prostate Cancer. *EMBO Journal.* 34 (4), 502-516. DOI: 10.15252/embj.201490306.
14. Wu D, Sunkel B, Chen Z, **Liu X**, Ye Z, Li Q, Grenade C, Ke J, Zhang C, Chen H, Nephew KP, Huang THM, Liu Z, Jin VX, Wang Q (2014). Three-tiered role of the pioneer factor GATA2 in promoting androgen-dependent gene expression in prostate cancer. *Nucl. Acids Res.* 42 (6), 3607-3622. DOI: 10.1093/nar/gkt1382. **(Breakthrough Article)**
15. **Liu X**, Han S, Wang Z, Gelernter J, Yang B (2013). Variant callers for next-generation sequencing data: a comparison study. *PLoS One* 8(9), e75619.
16. Wang Z, **Liu X**, Yang B, Gelernter J (2013). The Role and Challenges of Exome Sequencing in Studies of Human Diseases. *Frontiers in Genetics* 4, 160.

17. Cao J, **Liu X**, Han S, Zhang CK, Liu Z, Li D (2013). Association of the HTR2A Gene with Alcohol and Heroin Abuse. *Human Genetics* 133 (3), 357-365. PMID: 24178752.
18. Nie N, Zhao Y, Li M, **Liu X**, Jimenez S, Tang Y, Vazquez L (2010). Solving two-point boundary value problems of fractional differential equations via spline collocation methods. *Int. J. Model. Simul. Sci. Comput.* 1, 117-132.
19. Wu C, Zhang H, **Liu X**, DeWan A, Dubrow R, Ying Z, Yang Y, Hoh J (2009). Detecting Essential and Removable Interactions in Genome-Wide Association Studies. *Statistics and Its Interface* 2, 161-170.
20. Liu K, Waskow C, **Liu X**, Yao K, Hoh J, Nussenzweig M (2007). Origin of dendritic cells in peripheral lymphoid organs of mice. *Nat. Immunol.* 8, 578-583.
21. Glaser A, **Liu X**, Rokhlin V (2007). A Fast Algorithm for the Calculation of the Roots of Special Functions. *SIAM J. Sci. Comput.* 29, 1420-1438.
22. Tang Y, Cao J, **Liu X**, Sun Y (2007). Symplectic methods for the Ablowitz-Ladik nonlinear Schrödinger equation. *J. Phys. A: Math. Theor.* 40, 2425-2437.
23. **Liu X**, Zhang Q, Wang W (2004). Photo-ionization of Hydrogen Atom in a Circularly Polarized Standing Electromagnetic Wave. *Commun. Theor. Phys.* 41, 461-464.

#### Conference Posters:

1. Kramer J, Wetherill L, Acion L, Lai D, Bertelsen S, Koganti L, Goate A, Kuperman S, Meyers J, **Liu X**, Chan G, Langbehn D, Hesselbrock V, Bucholz K, Porjesz B and Foroud T (2018). Genetic associations with a dimensional measure of internalizing in a high-risk African American sample. The 41<sup>th</sup> Annual Research Society on Alcoholism Scientific Meeting. San Diego, California
2. Acion L, Kramer J, McCutcheon V, **Liu X**, Chan G, Kuperman S, Bucholz K, Hesselbrock V, Vaidya J, and COGA Collaborators (2017). Associations between internalizing characteristics and substance use in adults from families at high risk for alcoholism. The 40<sup>th</sup> Annual Research Society on Alcoholism Scientific Meeting. Denver, Colorado.
3. Acion L, Kramer J, **Liu X**, Chan G, Kuperman S, Almasy L, Bucholz K, Hesselbrock V, Vaidya J, McCutcheon V, and COGA Collaborators (2016). Internalizing symptom scale based on the adolescent and adult SSAGA in a prospective study of families at high risk for alcoholism. The 39<sup>th</sup> Annual Research Society on Alcoholism Scientific Meeting. New Orleans, Louisiana.