

Curriculum Vitae
for
Xiang-Yang (George) Lou, Ph.D.

Section on Statistical Genetics
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EDUCATION:

1997	Ph.D.	Statistical Genetics	Zhejiang University, China
1994	M.S.	Quantitative Genetics	Zhejiang University, China
1985	Associate	Agronomy	Zhejiang University, China

PROFESSIONAL EXPERIENCE:

09/2009 – Present	Associate Professor, Department of Biostatistics, University of Alabama at Birmingham, Birmingham, AL
07/2006 – 09/2009	Assistant Professor, Department of Psychiatry and Neurobehavioral Sciences, University of Virginia, Charlottesville, VA
08/2005 – 06/2006	Research Associate, Department of Psychiatry and Neurobehavioral Sciences, University of Virginia, Charlottesville, VA
09/2004 – 08/2005	Postdoctoral Fellow, Department of Psychiatry, UT Health Science Center at San Antonio, San Antonio, TX
01/2002 – 09/2004	Postdoctoral Associate, Department of Statistics, University of Florida, Gainesville, FL
10/1997 – 01/2002	Assistant Professor, Department of Agronomy, Zhejiang University, Hangzhou, China
09/1993 – 07/1996	Teaching Assistant, Department of Agronomy, Zhejiang University, Hangzhou, China

- 09/1988 – 02/1994 Research Assistant, Maize Research Institute, Zhejiang Agricultural Science Academy, Dongyang, China
- 07/1985 – 09/1988 Teacher, Shanglu High School, Dongyang, China

RESEARCH INTERESTS:

1. Statistical Genetics: Development of innovative statistical methodology for genetic and genomic studies of complex traits in humans, plants and animals (e.g., joint linkage and association mapping method, GMDR for detecting gene-gene and gene-environment interactions)
2. Bioinformatics: Development of novel computationally efficient bioinformatics tools scaled to large data sets for data mining that aim at hypothesis exploration and discovery (e.g., querying pathway and ontology databases and *in silico* mapping)
3. Genetic Epidemiology: Planning study design and performing data analysis of genetic epidemiological studies for complex human disorders using both linkage and association approaches (e.g., genome-wide association studies). The current focuses are nicotine dependence and other psychiatric disorders
4. Biostatistics: Clinical trial design, longitudinal data analysis, survival analysis, latent variable analysis and mixture modeling
5. Population Genetics: Development and application of new statistical approaches to genetic population inference, DNA structure analysis, genetic diversity evaluation, and paternity inference through mathematical and population genetic bridges such as coalescence model and phylogeny construction

HONORS AND AWARDS:

- 07/1993 1991-1993 excellent graduate student award (5% top graduate students)
- 02/1994 Early admission to Ph.D. program through competition (5% top graduate students)
- 04/2007 The 1st prize of Zhejiang Province's Science and Technology Award (Title: Genetic model and analysis methods for diallel designs and germplasm resource exploration; Authors: Jun Zhu, Jin Hu, Haiming Xu, **Xiang-Yang Lou**, Daofan Ji)

PROFESSIONAL ACTIVITIES:

- Member, American Society of Human Genetics
- Member, International Genetic Epidemiology Society
- Member, Genetics Society of China
- Member, Biomathematics Society of China
- Reviewer Panel, Natural Science Foundation of China

Reviewer, *Bioinformatics*
Reviewer, *Journal of Theoretical Biology*
Reviewer, *BMC Bioinformatics*
Reviewer, *BMC Genomics*
Reviewer, *Molecular Psychiatry*
Reviewer, *Psychological Medicine*
Reviewer, *Drug and Alcohol Dependence*
Reviewer, *Behavioral and Brain Functions*
Reviewer, *Molecular Genetics and Genomics*
Reviewer, *Genetica*
Reviewer, *Genetics Research*
Reviewer, *Genetic Testing*
Reviewer, *Journal of Genetics*
Reviewer, *Theoretical Biology and Medical Modelling*
Reviewer, *Journal of Genetics and Genomics*
Reviewer, *Chinese Journal of Rice Science*
Reviewer, *Acta Agriculturae Zhejiangensis*
Reviewer, *Journal of Zhejiang Agricultural Sciences*
Reviewer, *Journal of Fujian Agriculture and Forestry*

PUBLICATIONS:

1. Li MD, Xu Q, **Lou XY**, Payne TJ, Niu T, Ma JZ (2009) Association and interaction analysis of variants in CHRNA5/CHRNA3/CHRNA4 gene cluster with nicotine dependence in African and European Americans. *American J Medical Genetics B Neuropsychiatric Genetics* (accepted).
2. Dou BD, Hou BW, Xu HM, **Lou XY**, Chi XF, Yang JB, Wang F, Ni ZF, Sun QX (2009) Efficient mapping of a female sterile gene in wheat (*Triticum aestivum* L.). *Genetics Research* (accepted).
3. Chi XF, **Lou XY**, Yang MCK, Shu QY (2009) An optimal DNA pooling strategy for progressive fine mapping. *Genetica* 135 (3): 267-281. (the senior author)
4. Shi CH, Shi Y, **Lou XY**, Xu HM, Zheng X, Wu JG (2009) Identification of endosperm and maternal plant QTLs for protein and lysine contents of rice across different environments. *Crop and Pasture Science (Australian Journal of Agricultural Research)* 60 (3): 295–301.
5. **Lou XY**, Chen GB, Yan L, Ma JZ, Mangold JE, Zhu J, Elston RC, Li MD (2008) A combinatorial approach to detecting gene-gene and gene-environment interactions in

- family studies. *American Journal of Human Genetics* 83 (4): 457-467.
6. Chen GB, Payne TJ, **Lou XY**, Ma JZ, Zhu J, Li MD (2008) Association of amyloid precursor protein-binding protein, family B, member 1 with nicotine dependence in African and European American smokers. *Human Genetics* 124 (4): 393-398.
 7. Li MD, **Lou XY**, Chen GB, Ma JZ, Elston RC (2008) Gene-gene interactions among *CHRNA4*, *CHRN2*, *BDNF* and *NTRK2* in nicotine dependence. *Biological Psychiatry* 64 (11): 951-957.
 8. Chi XF, **Lou XY**, Shu QY (2008) Progressive fine mapping in experimental populations: An improved strategy toward positional cloning. *Journal of Theoretical Biology* 253 (4): 817-823. (the senior author)
 9. Li MD, Ma JZ, Payne TJ, **Lou XY**, Zhang D, Dupont RT, Elston RC (2008) Genome-wide linkage scan for nicotine dependence in European Americans and its converging results with African Americans in the Mid-South Tobacco Family sample. *Molecular Psychiatry* 13 (4): 407-416.
 10. Zheng X, Wu JG, **Lou XY**, Xu HM, Shi CH (2008) The QTL analysis on maternal and endosperm genome and their environmental interactions for characters of cooking quality in rice (*Oryza sativa* L.). *Theoretical & Applied Genetics* 116 (3): 335-342.
 11. Han LD, Xu HM, Zhu J, **Lou XY** (2008) Analysis of genetic effects of nuclear-cytoplasmic interaction on quantitative traits: Genetic models for seed traits of plants. *Theoretical & Applied Genetics* 116 (6): 769-776.
 12. Zheng X, Wu JG, **Lou XY**, Xu HM, Shi CH (2008) Mapping and analysis of QTLs on maternal and endosperm genomes for histidine and arginine in Rice (*Oryza sativa* L.) across environments. *Acta Agronomica Sinica* 34(3): 369-375.
 13. **Lou XY**, Chen GB, Yan L, Ma JZ, Zhu J, Elston RC, Li MD (2007) A generalized combinatorial approach for detecting gene-by-gene and gene-by-environment interactions with application to nicotine dependence. *American Journal of Human Genetics* 80 (6): 1125-1137.
 14. **Lou XY**, Ma JZ, Sun D, Payne TJ, Li MD (2007) Fine mapping of a linkage region on chromosome 17p13 reveals that associations of *GABARAP* and *DLG4* genes are associated with vulnerability to nicotine dependence in European-Americans. *Human Molecular Genetics* 16 (2): 142-153.
 15. Beuten J, Ma JZ, Payne TJ, **Lou XY**, Dupont RT, Crews KM, Elston RC, Li MD (2007) Association of specific haplotypes of neurotrophic tyrosine kinase receptor 2 gene (*NTRK2*) with vulnerability to nicotine dependence in African-Americans and European-Americans. *Biological Psychiatry* 61 (1): 48-55.
 16. Beuten J, Ma JZ, **Lou XY**, Payne TJ, Li MD (2007) Association analysis of the protein phosphatase regulatory subunit B1 (*PPP1R1B*) gene with nicotine dependence in European- and African-American smokers. *American J Medical Genetics B Neuropsychiatric Genetics* 144 (3): 285-290.

17. Li MD, Sun D, **Lou XY**, Beuten J, Payne TJ, Ma JZ (2007) Linkage and association studies in African- and Caucasian-American populations demonstrate that *SHC3* is a novel susceptibility locus for nicotine dependence. *Molecular Psychiatry* 12 (5): 462-73.
18. **Lou XY**, Ma JZ, Yang MCK, Zhu J, Liu PY, Deng HW, Elston RC, Li MD (2006) Improvement of mapping accuracy by unifying linkage and association analyses. *Genetics* 172 (1): 647-661.
19. **Lou XY**, Yang MCK (2006) Estimating effects of a single gene and polygenes on quantitative traits from a diallel design. *Genetica* 128 (1-3): 471-484. (the senior author)
20. **Lou XY**, Ma JZ, Payne TJ, Beuten J, Crew KM, Li MD (2006) Gene-based analysis suggests associations of the nicotinic acetylcholine receptor $\beta 1$ subunit (*CHRNBI*) and M1 muscarinic acetylcholine receptor (*CHRM1*) genes with vulnerability to nicotine dependence. *Human Genetics* 120 (3): 381-389.
21. Li MD, Payne TJ, Ma JZ, **Lou XY**, Zhang D, Dupont RT, Crews KM, Somes G, Williams NJ, Elston RC (2006) A genomewide search finds major susceptibility loci for nicotine dependence on chromosome 10 in African Americans. *American Journal of Human Genetics* 79 (4): 745-751.
22. **Lou XY**, Zhu J, Zhang QD, Zang RC, Chen YB, Yu ZL, Zhao YJ (2005) Genetic control of the *opaque-2* gene and background polygenes over some kernel traits in maize (*Zea mays* L.). *Genetica* 124 (2): 291-300.
23. Li MD, Beuten J, Ma JZ, Payne TJ, **Lou XY**, Garcia V, Duenes AS, Crews KM, Elston RC (2005) Ethnic- and gender-specific association of the nicotinic acetylcholine receptor $\alpha 4$ subunit gene (*CHRNA4*) with nicotine dependence. *Human Molecular Genetics* 14 (9): 1211-1219.
24. **Lou XY**, Casella G, Todhunter RJ, Yang MCK, Wu R (2005) A general statistical framework for unifying interval and linkage disequilibrium mapping: Towards high-resolution mapping of quantitative traits. *Journal of the American Statistical Association* 100 (469): 158-171.
25. **Lou XY**, Casella G, Littell RC, Yang MCK, Johnson JA, Wu RL (2003) A haplotype-based algorithm for multilocus linkage disequilibrium mapping of quantitative trait loci with epistasis. *Genetics* 163 (4): 1533-1548.
26. **Lou XY**, Todhunter RJ, Lin M, Lu Q, Liu T, Bliss SP, Casella G, Acland GM, Lust G, Wu RL (2003) The extent and distribution of linkage disequilibrium in Canine. *Mammalian Genome* 14 (8): 555-564.
27. Lin M, **Lou XY**, Chang M, Wu RL (2003) A general statistical framework for mapping quantitative trait loci in non-model systems: Issue for characterizing linkage phases. *Genetics* 165 (2): 901-913.
28. Wu RL, Ma CX, **Lou XY**, Casella G. (2003) Molecular dissection of allometry, ontogeny and plasticity: A genomic view of developmental biology. *BioScience* 53 (11):

1041-1047.

29. Liu PY, Zhu J, **Lou XY**, Lu Y (2003) A method for marker-assisted selection based on QTLs with epistatic effects. *Genetica* 119 (1): 75-86.
30. Chi XF, Wu DX, **Lou XY**, Xia YW, Shu QY (2003). Comparative studies on the starch gelatinization characteristics of five cereal crops (in Chinese). *Acta Agrocultural Sinica* 29 (2): 300-304.
31. **Lou XY**, Zhu J (2002) Analysis of genetic effects of major genes and polygenes on quantitative traits. I. Genetic model for diploid plants and animals. *Theoretical & Applied Genetics* 104 (2-3): 414-421.
32. **Lou XY**, Zhu J (2002) Analysis of genetic effects of major genes and polygenes on quantitative traits. II. Genetic model for seed traits of crops. *Theoretical & Applied Genetics* 105 (6-7): 964-971.
33. Wu RL, **Lou XY**, Ma CX, Wang XL, Larkins BA, Casella G. (2002) An improved genetic model generates high-resolution mapping of QTL for protein quality in maize endosperm. *Proceedings of the National Academy of Sciences of the United States of America* 99 (17): 11281–11286.
34. Cao LY, **Lou XY**, Si HM, He LB, Sun ZX (2002) Comparison between two methods of establishing DH population for mapping *lox-3* gene in rice (*Oryza sativa* L.) (in Chinese). *Hereditas* (BEIJING) 24 (4): 159-162.
35. Yu ZL, Zhao JH, **Lou XY** (1999) Analyses of genetic effects on kernel traits in maize (*Zea mays* L.) (in Chinese). *Zhejiang Agricultural Science* 99 (4): 171-174.
36. **Lou XY**, Zhu J, Zhang QD, Zang RC, Chen YB (1998) A genetic study on the effects of *opaque-2* and polygenes on kernel quality traits in maize. In: Chen LS, Ruan SG, Zhu J (eds), *Advanced Topics in Biomathematics: Proceedings of International Conference on Mathematical Biology*, Singapore: World Scientific Pub Co pp 143-148.
37. **Lou XY**, Zhang QD, Yu ZL, Zhao JH (1998) Studies on genetic effects of some quantitative ear traits in maize (*Zea mays* L.) (in Chinese). *Zhejiang Agricultural Science* 98 (1): 21-24.

GRANT SUPPORT:

Principal Investigator (07/01/2008 – 04/30/2013) National Institute on Drug Abuse, NIH (No. R01-DA025095, \$1,136,250). “Detection of multifactor interactions with application to nicotine dependence.”

Co-Investigator (07/01/2009 – 04/30/2013), National Institute on Drug Abuse, NIH (No. DA-12844, \$5,500,000). “Fine mapping susceptibility loci for nicotine dependence.”

Co-Investigator (03/01/2006 – 02/28/2009), National Institute on Drug Abuse, NIH (No. DA-12844, \$1,409,332). “Fine mapping susceptibility loci for nicotine dependence.”

Co-Investigator (09/01/2005 – 08/31/2006), National Institute on Drug Abuse, NIH (No. DA-12844, \$ 170,494). “Mapping of susceptibility loci for nicotine dependence.”

- Co-Investigator (01/01/2006 – 12/31/2008), Natural Science Foundation of China (No. 30571198). Project title “Genetic model for mapping embryo, endosperm and maternal plant QTLs underlying seed quality traits in cereal crops and its application to a rice breeding study.”
- Principal Investigator (01/01/2001 – 12/31/2003), Natural Science Foundation of China (No. 30000097). “Developing a mapping method for QTL with conditional genetic effect and the dynamic gene expressions of QTLs for some agronomic traits in rice (*Oryza sativa* L.)”
- Principal Investigator (07/01/1999 – 12/31/2002), Zhejiang Education Commission Grant (No. 19990032). “Mapping a storable gene (*lox-3*) in rice (*Oryza sativa* L.) and its utilization in breeding.”
- Co-Investigator (01/2000 – 12/2002), Natural Science Foundation of China (No. 39970473). “Developing new methods for improving genetic population and predicting heterosis based on QTL effects”.
- Co-Investigator (01/1999 – 12/2002), Key Project of Natural Science Foundation of China (39830250). “Studies on the mechanism of inheritance and environmental control for cereal quality traits in rice (*Oryza sativa* L.)”.
- Co-Investigator (01/1998 – 12/2001), Important Project of Natural Science Foundation of China (39893354). “Developing genetic models and statistical methods for mapping QTLs”.
- Co-Investigator (01/1999 – 12/2001), Natural Science Foundation of Zhejiang Province (398265). “Identification, location, and exploitation of important genes for cereal quality traits in *indica* rice”.
- Co-Principal Investigator (01/1997 – 12/1999), Natural Science Foundation of China (39670390). “Genetic mechanism of quantitative traits with developmental behavior in crop and their utilization”.
- Co-Investigator (01/1994 – 12/1996), Transcentury Training Program Foundation for the Talents of the National Education Commission of China. “Genetic studies on quantitative cereal quality traits in crop”.
- Co-Investigator (01/1991 – 02/1994), Key Project of the Science and Technology Committee of Zhejiang Province in the 8th Five Year Plan. “Maize breeding”.
- Co-Investigator (09/1988 – 12/1990), Key Project of the Science and Technology Committee of Zhejiang Province in the 7th Five Year Plan. “Maize breeding”.

PRESENTATIONS/PUBLISHED ABSTRACTS/POSTERS:

- Unifying multilocus linkage and linkage disequilibrium mapping: A human model. Division of Biostatistics, School of Public Health, Yale University. May 18, 2004
- Unifying multilocus linkage and association mapping: A human model. Department of Epidemiology and Biostatistics, Case Western Reserve University School of Medicine.

November 6, 2004

GMDR: A novel strategy for detecting multifactor interactions. The 3rd International Conference of Quantitative Genetics, Hangzhou, China. August 23, 2007.

GMDR: A novel strategy for detecting multifactor interactions. Maize Research Institute, Zhejiang Agricultural Science Academy (Invited Speaker), Dongyang, Zhejiang, China. September 7, 2007.

GMDR: A novel strategy for detecting multifactor interactions. Institute of Bioinformatics, Zhejiang University (Invited Speaker), Hangzhou, China. September 29, 2007.

Generalized MDR approaches to detecting multifactor interactions in population-based and family-based studies. Department of Biostatistics, University of Alabama at Birmingham, Birmingham, AL. October 20, 2008.

Generalized MDR approaches to detecting multifactor interactions in population-based and family-based studies. Department of Psychiatry and Neurobehavioral Sciences, University of Virginia, Charlottesville, VA. December 5, 2008.

Generalized combinatorial approaches to detecting multifactor interactions in population-based and family-based studies. The Joint Conference of the Society for Mathematical Biology and the Chinese Society for Mathematical Biology, Hangzhou, China. June 15, 2009.

Li MD, **Lou XY**, Chen GB (2008). "Linkage Studies of Nicotine Dependence" at the Short Course on the Genetics and Epigenetics of Addiction (National Institute on Drug Abuse, Bethesda, MD, Mar 31 - Apr 4, 2008)

Lou XY, Zhu J (2001). Analysis of genetic effects of major genes and polygenes on quantitative traits. The 2nd Meeting of Plant Genomics in China. Hangzhou, China, August 2001.

Lou XY, Ma JZ, Yang MCK, Zhu J, Liu PY, Deng HW, Elston RC, Li MD (2005). Improvement of mapping accuracy by unifying linkage and association analyses. The 55th Annual Meeting of the American Society of Human Genetics, Salt Lake City, UT, October 25-29, 2005.

Lou XY, Ma JZ, Sun D, Payne TJ, Li MD (2006). Fine mapping of a linkage region on chromosome 17p13 reveals that GABARAP and DLG4 are associated with vulnerability to nicotine dependence in European-Americans". The 56th Annual Meeting of the American Society of Human Genetics, New Orleans, LA, October 9-13, 2006.

Li MD, Beuten J, Ma JZ, **Lou XY**, Payne TJ (2006). Association analysis of the protein phosphatase regulatory subunit B1 gene with nicotine dependence in European-Americans and African-Americans. 68th Annual Scientific Meeting of the College on Problems of Drug Dependence. Scottsdale, AZ.

Li MD, Sun D, **Lou XY**, Beuten J, Payne TJ, Ma JZ (2006). Linkage and association studies in African- and Caucasian-American populations demonstrate that SHC3 is a novel susceptibility locus for nicotine dependence. Program No. 393.4. 2006 Neuroscience

Meeting Planner. Atlanta, GA: Society for Neuroscience.

Lou XY, Chen GB, Yan L, Ma JZ, Zhu J, Elston RC, Li MD (2007). A generalized combinatorial approach for detecting gene by gene and gene by environment interactions. The 57th Annual Meeting of the American Society of Human Genetics, San Diego, CA, October 23-27, 2007.

Chen GB, **Lou XY**, Yan L, Zhu J, Li MD (2007). GMDR: A package for detecting gene-by-gene and gene-by-environment interactions underlying complex traits. The 57th Annual Meeting of the American Society of Human Genetics, San Diego, CA, October 23-27, 2007.

Li MD, **Lou XY**, Chen GB, Ma JZ, Elston RC (2007). Interactive Contributions of CHRNA4, CHRN2, BDNF and NTRK2 to Nicotine Dependence. The 57th Annual Meeting of the American Society of Human Genetics, San Diego, CA, October 23-27, 2007.

Lou XY, Chen GB, Yan L, Ma JZ, Zhu J, Elston RC, Li MD (2007). GMDR: A novel strategy for detecting multifactor interactions. The 3rd International Conference of Quantitative Genetics, Hangzhou, China. August 19-24, 2007.

Chi XF, **Lou XY**, Shu QY (2007). Optimizing DNA pooling strategy for progressive fine genetic mapping. The 3rd International Conference of Quantitative Genetics, Hangzhou, China. August 19-24, 2007.

Xu HM, Yang J, **Lou XY**, Shi CH, Zhu J (2007). Mixed model approach for mapping quantitative trait loci underlying crop seed traits. The 3rd International Conference of Quantitative Genetics, Hangzhou, China. August 19-24, 2007.

Lou XY, Chen GB, Yan L, Mangold JE, Ma JZ, Zhu J, Elston RC, Li MD (2008). A generalized combinatorial approach for detecting gene by gene and gene by environment interactions. The 17th Annual Meeting of the International Genetic Epidemiology Society, St. Louis, Missouri, September 14-16, 2008.

TEACHING ACTIVITIES:

- “Linkage Studies of Nicotine Dependence” at the Short Course on the Genetics and Epigenetics of Addiction, National Institute on Drug Abuse, Bethesda, MD, Mar 31 - Apr 4, 2008 (with Dr. Ming D. Li)
- Graduate Courses:
 - Advanced Population Genetics (1997 – 2002)
 - Linear Models and Statistical Analysis Methods (1997 – 2001)
- Undergraduate Courses:
 - Plant Breeding (1999 – 2000)
 - Biostatistics (1993 – 2000)
- High School Student Course:

Biology (1985 – 1988)

COMPUTER SKILLS:

Languages: BASIC, C/C++, Fortran, Java++

Packages: SAS, SPLUS/R, MATLAB, MATHEMATICA, SIGMAPLOT, PERL, EXCEL,
WORD, POWERPOINT, LATEX, and most statistical genetics softwares

Systems: MS-DOS/WINDOWS, LINUX/UNIX