

## NANCY RUONAN ZHANG

### CONTACT INFORMATION

*Mailing address* Department of Statistics  
Sequoia Hall  
Stanford University  
390 Serra Mall,  
Stanford, CA 94305-4065, USA.

*E-mail* nzhang@stanford.edu

*Telephone* 1-650-283-4024 (Cell)  
1-650-725-2223 (Office)

### EDUCATION

*Post-doctoral Fellow* Dept. of Statistics  
10/2005 - 7/2006 University of California at Berkeley

*Doctor of Philosophy* Dept. of Statistics  
9/2002 - 9/2005 Stanford University, CA.

*Master of Science* Dept. of Computer Science,  
9/2000 - 6/2001 Stanford University, CA.

*Bachelor of Science* Dept. of Mathematics,  
9/1997 - 6/2001 Stanford University, CA.

### RESEARCH INTERESTS

- (1) Statistical model assessment and variable selection in irregular and high dimensional models.
- (2) Change-point models and scan statistics.
- (3) DNA copy number analysis.
- (4) Mutation profiling using high throughput genome resequencing data.

### DISSERTATION RESEARCH (ADVISOR: DAVID SIEGMUND)

- (1) Model selection for changepoint problems, with applications to comparative genomic hybridization data.
- (2) Statistical analysis of scores of optimal biological sequence alignments.

### PUBLISHED MANUSCRIPTS

- (1) Zhang, N.R. and Siegmund, D.O., 2006, A Modified Bayes Information Criterion with Applications to the Analysis of Comparative Genomic Hybridization Data. *Biometrics* 63, 22-32.

- (2) Chan, H.P. and Zhang, N.R., 2007, Scan Statistics with Weighted Observations. *JASA Theory and Methods*, 102, 595-602.
- (3) The Encode Consortium, 2007, Identification and analysis of functional elements in 1% of the human genome by the ENCODE pilot project. *Nature* 447, 799-816.
- (4) Lai T.L., Xing, H and Zhang, N.R., 2008, Stochastic segmentation models for array-based comparative genomic hybridization data analysis. *Biostatistics*, 9, 290307.
- (5) Zhang, N.R., Wildermuth, M.C., and Speed, T.P. 2008, Transcription factor binding site prediction with multivariate gene expression data. *Annals of Applied Statistics*, 2, 332-365.
- (6) Zhang, N.R., Siegmund, D.O., Ji, H., and Li, J., 2009, Detecting simultaneous change-points in multiple sequences. *Biometrika*, *in press*.
- (7) Chan, H.P., Tu, I.P. and Zhang, N.R., 2009, Boundary Crossing Probability Computations in the Analysis of Scan Statistics. Will appear in *Scan Statistics - Methods and Applications*. Birkhauser, Boston.
- (8) Li, F. and Zhang, N., 2009, Bayesian Variable Selection in Structured High-Dimensional Covariate Spaces with Applications in Genomics. *Accepted for publication in JASA Theory and Methods*.
- (9) Zhang, N.R., Senbabaoglu, Y., and Li, J., Joint Estimation of DNA Copy Number from Multiple Platforms. *Accepted for publication in Bioinformatics*.

#### SUBMITTED PREPRINTS (IN ORDER OF SUBMISSION)

- (1) Importance sampling of word patterns in DNA and protein sequences. (*with Hock Peng Chan and Louis H.S. Chen.*)
- (2) Non-Parametric Methods for Genomic Inference. (*with Peter Bickel, Nathan Boley, Ben Brown, and Haiyan Huang.*)
- (3) An Algorithm for the Identification of Insertion-Deletion Mutations from Next Generation Sequencing. (*with Georges Natsoulis et al.*)
- (4) Stochastic segmentation models for allele-specific copy number estimation with SNP-array data. (*with Hao Chen and Haipeng Xing.*)
- (5) Local average likelihood ratio test statistics with applications in genomics and change-point detection. (*with Hock Peng Chan.*)
- (6) DNA copy number profiling in normal and tumor genomes. (*single-authored book chapter.*)

#### TEACHING

I have taught the following courses at Stanford:

- (1) Statistics 190 (Applied Statistics)
- (2) Statistics 203 (Introduction to ANOVA)
- (3) Statistics 205 (Nonparametric Statistics)

- (4) Statistics 215 (Stochastic processes with applications in biology)
- (5) Statistics 345 (Special topics course in computational biology)
- (6) Statistics 345/Genetics 245 (Statistical methods in genetics).

#### HONORS AND AWARDS

- (1) 2007 New World Silver Medal for the Best PhD Thesis in the Mathematical Sciences
- (2) Honorary Stanford Graduate Fellow (2002)
- (3) National Defense Science and Engineering Graduate Fellowship (2002)
- (4) Edison International Undergraduate Fellowship (1997)

#### FUNDING

- (1) Terman Fellowship (2006)
- (2) NSF DMS Grant ID 0906394 (2009)

#### STUDENTS I AM CURRENTLY ADVISING

- (1) Hao Chen, doctoral candidate, Department of Statistics, Stanford University.
- (2) Yi Liu, doctoral candidate, Department of Statistics, Stanford University.
- (3) Yunting Sun, doctoral candidate, Department of Statistics, Stanford University.
- (4) Jeremy Shen, doctoral candidate, Department of Statistics, Stanford University.
- (5) Sonya Marie Schuh-Huerta, Postdoctoral Researcher, Institute for Stem Cell Biology & Regenerative Medicine, Stanford University.

#### SERVICE AND SYNERGISTIC ACTIVITIES

- 2006-current:** Part of the development team for the statistical analysis portal for ENCODE data (<http://encode.dyndns.org/>).
- 2007-current:** Faculty advisor for the Computational Mathematics Undergraduate major at Stanford University.
- 2007 summer:** Coordinated the Stanford VPUE Undergraduate Research Program, advised undergraduates in their research projects.
- 2007 spring-current:** Post-doctoral co-advisor to Sonya Schuh-Huerta, Ph.D., Institute for Stem Cell Biology & Regenerative Medicine at the Stanford School of Medicine.