

Jan 01, 2008

Corresponding person
Address

Dear Chair of Search Committee/Dr.....:

I am writing to apply for the tenure-track Assistant Professor in statistics beginning August 2008, as posted on EIMS website. I am currently a doctoral candidate specializing in statistics in Department of Mathematics at Syracuse University and will complete my degree requirements in Summer 2008. I believe that my research and teaching experience prepare me to contribute to your department as an effective researcher and instructor.

I have a demonstrated commitment to research. In my dissertation entitled "Multiple Decision Rules for Multivariate Normal Populations and their Applications", I construct multiple decision rules, including ranking and selection, screening, partitioning, multiple comparisons and multiple testing, for multivariate normal populations. I also use simulation and resampling methods, and apply theoretical results to multiple target detection in signal processing. I plan to construct sequential procedures for selecting and multiple testing in the multivariate normal case, continue my research in multiple target detection, and apply my research to clinical trials, bioequivalence and information theory. I also plan to connect ranking and selection with discriminant analysis and principal component analysis and apply to bioinformatics.

In addition to my research, I have a solid teaching record with experience teaching a range of courses from entry level mathematics to applied statistics. For the past two years, I have been teaching Elementary Probability and Statistics I & II. Moreover, for the past three summers, I have been a summer-start instructor, teaching and mentoring students from high school and helping them build their confidence for further mathematics courses. I have experience conducting statistics labs and teaching students how to use Minitab. I also provide help for students as a mathematical and statistical consultant. This position gives me a lot of opportunities to tutor and mentor students.

I am not only interested in teaching elementary probability and statistics courses, calculus and linear algebra, but also linear models, design and analysis of experiments, statistical packages, simulation, statistical inference and (theoretical or applied) multivariate statistical analysis. I also like to develop other statistics topics, such as statistical applications in clinical trials/target detection. Moreover, I would like to work with students and direct their research in statistics.

I am enclosing my CV and teaching statement. You will be receiving my letters of recommendation under separate cover. You are very welcome to visit my homepage at <http://web.syr.edu/~wcai01/>. Thank you very much for your consideration.

Sincerely,

Weixing Cai

Research Experiences:

- 2006 Spring-present: Studied and proposed new multiple decision rules, including ranking and selection, multiple comparison (multiple testing), group sequential analysis (including sequential sampling) for k multivariate normal populations, applied results to multiple target detection in signal processing and imaging processing, treatment comparison and selection, and multivariate bioequivalence, therapeutic equivalence, non inferiority and superiority based on multiple end points.
Combined selection theory with discriminant analysis and applied to microarray gene expression data analysis
- 2005 Fall: Studied methods for dimension reduction, such as principal component analysis by using ranking and selection theory.
- 2005 Spring-Summer: Studied design of experiment, ranking and selection, sequential decision rules for binomial populations and normal populations, and applied to clinical trials, including adaptive sampling rules: vector-at-a-time and one-at-a-time.

Projects Experiences

- 2007 Spring Response Methodology Model (RMM) and its Applications in Sciences and Engineering (Matlab simulation)
- 2005 Fall Simulation project: Comparison of Methods to Determine the Number of Important Principal Components (Matlab simulation)
- 2005 Spring Time series models project: Dynamic Models for House Price in United States (SCA)
Factor Analysis, Discriminant Analysis, Cluster Analysis and Canonical Correlation Analysis in two European data sets: consuming and location (SAS)
- 2004 Fall Methods for Detecting Influential Points in Regression Models

Publications

- Weixing Cai and Pinyuen Chen, "Screening for Multiple Target Detection" to appear in *Communications in Statistics, Theory and Methods*, Volume 37, Issue 12.
- Weixing Cai and Edward J. Dudewicz, "The Generalized Bootstrap: A New Fitting Strategy & a Simulation Study Showing Advantage over Bootstrap Percentile Methods", accepted for *the Proceedings Volume of the Symposium on Fitting Statistical Distributions to Data*, Auburn University. To appear in *American Journal of Mathematical and Management Sciences*.
- Weixing Cai and Pinyuen Chen, "Partitioning k Multivariate Normal Populations with Respect to a Standard Vector", *Journal of Statistical Planning and Inference*, under revision.
- Weixing Cai and Pinyuen Chen, "Testing and Selecting among k Multivariate Normal Populations for Equivalence with Respect to a Standard Vector", submitted to *Journal of Multivariate Analysis*, 2007.

Sun Yat-sen University, Guangzhou, China

- 1999-2003 First Honor Student Scholarship (three times)
- 06/2003 Certificate of Outstanding Undergraduate Student

Some Graduate Courses: Linear Algebra, Mathematical Analysis, Real Analysis, Complex Analysis, Functional Analysis, Numerical Analysis, Optimization, Statistics Inference (I & II), Probability (I & II), Linear Model, Time Series Analysis, Multivariate Analysis (Applied and Theoretical), Analysis of Variance, Sampling Theory, Simulation, Distribution Fitting and Independent studies in: Multiple Decision Rules including ranking and selection and multiple testing, Sequential Analysis, Bayesian Analysis and Signal Processing and Clinical trials.

Professional Affiliations

- American Mathematical Society (AMS)
- American Statistical Association (ASA)
- Society for Industrial and Applied Mathematics (SIAM)

Software Skills

- Programming Languages: MATLAB, C, Fortran
- Statistical Software: SAS, SCA, SPSS and Minitab

References

Professor Pinyuen Chen (Thesis Advisor) (Emeriti) Professor Edward J. Dudewicz

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In addition, I enjoy helping students build their confidence in mathematics. I encourage students to present their homework answers on the chalkboard. They are also welcome to express their opinions through in-class discussions. When they are frustrated, I comfort the students and tell them they can improve by spending more time on solving problems. I always teach them how to solve difficult problems step by step. I also like to give more difficult extra-credit problems on tests or exams to challenge more hardworking students.

Diversity encompasses multiple dimensions, including, but not limited to, race, culture, nationality, ethnicity, class, gender, disability and age. It is our obligation to consider the heterogeneous backgrounds of our students when we teach them. Specifically, I care about the students' diverse learning abilities when I teach. Equity is not the same as equality. Sometimes we may have to treat students differently. For some students, I need to spend more time in helping them to learn new material during my office hours. They benefit a lot from this kind of one-on-one setting. Some female students may think that mathematics is a domain of men and that they are not good at mathematics. Therefore, the first thing we need to do is change their minds and tell them that they can do well in mathematics. In my classes, students are in different years. For freshman students, I pay more attention to inspiring their interests in learning mathematics and helping them to build their confidence in further courses. For excellent students in my classes who want to extend their learning, I list some literature for them to read. For students who have learning disabilities, I am always patient to answer any of their questions and give them more help during office hours.

A great teacher is patient, enthusiastic, motivating and dedicated. Though I have learned a lot during my experiences in teaching, I am always thinking about how to be a better teacher by reflecting on my style and teaching strategies. In the future, I want to keep doing what has worked well for me, but I also want to find new ways that I can improve.

I am not only interested in teaching elementary probability and statistics courses (including non-calculus and calculus based), college algebra, finite mathematics, precalculus, calculus and linear algebra, but also sampling design and theory, linear and non-linear models, design of experiments, ANOVA, statistical computing with packages (such as SAS), simulation, statistical inference and (theoretical or applied) multivariate statistical analysis (classical statistical inferences, MANOVA, including principal component analysis, factor analysis, discriminant analysis, canonical correlation and cluster analysis).