Hyunsook Lee

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Department of Statistics
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Education

The Pennsylvania State University, University Park, PA.
Ph.D in *Statistics* and Minor in *Electrical Engineering*, Aug. 2006.
Advisor: Prof. G. Jogesh Babu
Dissertation: *Two Topics*: A Jackknife Maximum Likelihood Approach to Statistical Model Selection and a Convex Hull Peeling Depth Approach to Nonparametric Massive Multivariate Data Analysis with Applications

The Pennsylvania State University, University Park, PA
M.S. in *Statistics*, May 2004
Advisor: Prof. G. Jogesh Babu
Thesis: Model Selection Based on Maximum Likelihood Estimation: A Jackknife Approach

Seoul National University, Seoul, Korea
M.S. in *Astronomy*, Aug. 1999
Advisor: Prof. Hong Sik Yun
Thesis: Physical Properties of the SUN Observed by UV lines

Seoul National University, Seoul, Korea
B.S. in *Astronomy*, Feb. 1997 (ranked 3^{rd})

Chungnam Girls' High School, Daejon, Korea
summa cum laude, Feb. 1993
Major's award of excellence in academic achievement and leadership

Research Experience

SAMSI Graduate Fellow — SAMSI
Research Triangle Park, NC — *Spring, 2006*
I joined as Graduate Fellow a semester long Astrostatistics program at SAMSI. Having astrophysics background eased communications with people from two different disciplines and enabled to pick up good research topics. I became a web manager of Survey and Population Study group (http://www.samsi.info/200506/astro/workinggourp/sps) and Particle Physics group (http://www.samsi.info/200506/astro/workinggoup/phy).

Research Assistant — Prof. G. Jogesh Babu
PSU — *May 2003- Aug. 2006*
My advisor allowed me to study various topics such as *Model Selection, Resampling (Cross Validation, Jackknifing, Bootstrapping), Large Astronomical Database, Streaming Data, Convex Hull Peeling, Stochastic Geometry, Computational Geometry, Spatial Point Process, Nonparametric Multivariate Analysis, Descriptive Statistics, Mixture Models, Bump Hunting, and Data Mining.* My thesis incorporates these topics.

Visitor — Big Bear Solar Observatory
Big Bear, CA — *Sept. and Oct., 1998*
I learned softwares (including IDL) for analyzing UV spectrum data obtained from SUMER/SOHO for my master's thesis and gained some experience in observatory operation.

Research Assistant — Prof. Hong Sik Yun
Seoul National University — *Mar. 1998- Aug. 1999*
I conducted various activities in Solar Physics group at SNU, like SUMER UV spectrum analysis and Solar Patrol Observing Telescope (SPOT, http://astro.snu.ac.kr/SPOT).

Work Experience

Summer School Assistant — Prof. Babu, Center for Astrostatistics
PSU — *June, 2005 and 2006*
Summer school for astronomers and physicists: Including computing lab classes (in R, IDL, and EMMIX), I helped summer school teachers and students.

Intern — Minitab Inc.
State College, PA — *Spring, 2003*
Minitab, Inc. was developing Korean version and needed a person who is bilingual and aware of statistics to verify and to correct their new product. I learned the process of developing softwares in different languages.

Graduate Statistical Consultant — Statistical Consulting Center
PSU — *Aug. 2001 -May 2002*
I consulted six clients from food science, animal science, agricultural science, chemistry, kinesiology, and astronomy, from which I learned various statistical needs in different studies and useful ways to communicate with them.

Summer Manager — AT&T Labs
Middletown, NJ — *Summer, 2001*
My project was related to fraud detection with data mining tools. With SQL, I acquired phone call data and analyzed different patterns between fraud and good customer groups. Mostly, I used SAS Enterprise Miner and Splus.

Editor Assistant — Journal of Korean Astronomical Society
Seoul National University — *1999*
Prof. Hyung-Mok Lee was editor at that time. I helped him to redesign layouts of the journal by changing latex templates and reviewed submitted papers.

Teaching Experience

Instructor — Dept. of Statistics
PSU — *Fall 2006*
Course Title: Introduction to Mathematical Statistics
Required course for senior students in statistics and mathematics departments. Among 65 students some are from engineering and education. Designed projects for and guided an honor option student. Further information can be found from `http://www.stat.psu.edu/~hlee/415.F06/`

Lecturer — Dept. of Statistics
PSU — *Spring, Summer, and Fall 2002*
Course Title: Design Experiments
Statistics for senior engineering students. The size of classes was from 30 to 90 depending on semesters. Details on this course can be found from my website at
`http://www.stat.psu.edu/~hlee/stat401.html`.

Teaching Assistant — Dept. of Statistics
PSU — *2000 -2001*
Undergraduate Level Courses: *Design Experiments, Introduction to Statistics*
Graduate Level Courses: *Theoretical Statistics, Regression Analysis*
Duties were grading homeworks, making solutions, holding office hours, maintaining course websites, and substituting lecturers occasionally.

Tutor — MASCSA
PSU — *Summer and Fall, 2000*
MASCSA stands for Morgan Academic Support Center for Student-Athletes. (see `http://www.mascsa.psu.edu/tutoring.html`) I helped Penn State athletes based on their needs due to their absences from classes to perform their athletism.

Teaching Assistant — Dept. of Astronomy
Seoul National University — *1997-1998*
Courses: *Stellar Astronomy, Solar System Astronomy, Introduction to Astronomy, Introduction to Cosmology* Duties were grading homeworks, making solutions, holding office hours, typing lecture notes, and preparing lab classes.

Publications

H. Lee (2007). *Nonparametric Multivariate Analysis of SDSS Quasars by Convex Hull Peeling* Statistical Challenges in Modern Astronomy IV, G. J. Babu and E. D. Feigelson (eds.), *submitted.*

H. Lee (2006). *New Statistical Insights of Globular Cluster Systems* Astronomical Data Anaysis Software and Systems XV, **351**, Ed. Gabriel et.al., 181-184.

H. Lee, H. Yun, and J. Chae (2000). *Nonthermal Broadening of UV lines Observed at the Limb of the Quiet Sun* Journal of the Korean Astronomical Society, 33:57-73 (`http://www.kas.org/e-journals/Web_JKAS/data/331/331057.pdf`)

Presentations

Statistics Dept., Harvard University, Cambridge, MA (Sept. 2006)
A Convex Hull Peeling Depth Approach to Nonparametric Massive Multivariate Data Analysis with Applications - Presented for Topics in Astrostatistics Course.

Joint Statistical Meeting, Seattle, WA (Aug. 2006)
A Nonparametric Approach to Descriptive Measures of Multivariate Massive Data Based on Convex Hull Peeling Depth

New Researchers' Conference, Seattle, WA (Aug. 2006)

Statistical Challenges in Modern Astronomy, PSU, PA (June 2006)
Nonparametric Approach to Multivariate Massive Data Analysis by Convex Hull Peeling

Interface 2006, Pasadena, CA (May 2006)
Detecting Outliers in Multivariate Massive Data by Convex Hull Peeling with Applications

Astrostatistics Workshop at SAMSI, NC (Jan. 2006)
Convex Hull Peeling: Nonparametric Multivariate Analysis Tools

ADASS XV, El Escorial, Spain (Oct. 2005)
New Statistical Insights of Globular Cluster Systems

Joint Statistical Meeting, Minneapolis (Aug. 2005)
Multivariate Quantile Estimation with Convex Hull Peeling for Streaming Data

Joint Statistical Meeting, Toronto (Aug. 2004)
Model Selection Based on Maximum Likelihood Estimation: A Jackknife Approach

Papers in Progress

H. Lee, G.J. Babu, and C.R. Rao (2006).
A Jackknife Maximum Likelihood Approach to Statistical Model Selection.

H. Lee and W.K. Jenkins (2006).
Application of Statistical Resempling Methods to the Adaptive Filter Design.

Honors and Awards

Financial Support, IMS New Researchers' Conference (Aug. 2006)
Financial Support, SCMA IV (June 2006)
Financial Support, Interface2006 (May 2006)
Travel Support, ADASS XV (Oct. 2005)
Assistantship, Dept. of Statistics, PSU (2000-Aug. 2006)
Travel Grants, Dept. of Statistics, PSU (2004 -2006)
Homeyer Graduate Fellowship, Dept. of Statistics, PSU (2003 -2004)
Rotary Foundation Scholarship, The Rotary Foundation (2000)
Seoul National University Scholarships and Fellowships (1993 -1998)

Computer Skills

Computing Platforms: UNIX, Linux, Windows
Languages and Packages: R, Splus, C/C++, Fortran, SAS, Minitab, IDL, Matlab, Mathematica, SQL, LaTeX

Graduate Level Courses Taken	*Statistics*: Regression Models, Theory of Statistics I and II, Design and Analysis of Experiments, Stochastic Process, Time Series Analysis, Mixtures, Survival Analysis, Asymptotic Tools, Linear Models I, Applied Multivariate Analysis, Biostatistical Methods, Probability I and II, Statistical Inference I and II, Data Mining I, Spatial Statistics, Statistical Consulting Practicum I and II, Topics in SAS, Colloquium I and II *EE and others*: Computational Physics, Adaptive Signal Processing, Topics in Signal Processing, Information Theory, Nonlinear Control and Stability, Stochastic Process and Estimation, and Thesis Workshop
Professional Associations	American Statistical Association Institute of Mathematical Statistics
Activities Outside Statistics	State College Choral Society, 2001- Penn State Women's Choral, 2000 Seoul Gregorian Chant Scholars, 1999 (only choir in this category in Korea)
References	Available upon request.