TEXAS A&M UNIVERSITY
DEPARTMENT OF STATISTICS

CEREMONY TO AWARD

EMANUEL AND CAROL PARZEN PRIZE
FOR STATISTICAL INNOVATION

TO

ALAN E. GELFAND

APRIL 10, 2006
RUDDER TOWER, ROOM 301

3:45 p.m. Parzen Prize Ceremony
4:00 p.m. Lecture Presentation

LOOKING BACK ON 15 YEARS OF MCMC: ITS IMPACT IN THE STATISTICAL (AND BROADER) RESEARCH COMMUNITY

5:00 p.m. Reception, Rudder 301

ALAN E. GELFAND

The 2006 EMANUEL AND CAROL PRIZE FOR STATISTICAL INNOVATION is awarded to Alan E. Gelfand (James B. Duke Professor of Statistics and Decision Sciences, Duke University) for his significant research in statistical theory and applications which has transformed Bayesian practice by pioneering statistical inference by Markov Chains Monte Carlo (MCMC) and the Gibb sampler, innovated methods for spatial statistics, hierarchical modeling and model determination, and provided leadership in research in environment and earth sciences.

Professor Gelfand has an international reputation as a world class pioneer in the theory and practice of Bayesian statistics and spatial statistics. He has given an extraordinary number of invited talks and is one of the most cited mathematical scientists in the world. The number and influence of his Ph. D. students (most of whom are having distinguished careers as academics) is unusually high.

Professor Gelfand was born on April 17, 1945 in New York City. He received his Ph.D. in 1969 from Stanford (arguably the Golden Age decade of the Stanford Statistics Department). Professor Gelfand is a Fellow of the American Statistical Association and the Institute of Mathematical Statistics. In 2001 he received the Mosteller Statistician of the Year Award. He is President of the International Society for Bayesian Analysis. His career is extraordinary for the number and influence of papers he publishes, and the friendship he extends to colleagues. By celebrating the career of Alan Gelfand we are celebrating the increasing role in society and science of the profession and discipline of Statistics.

ABSTRACT

LOOKING BACK ON 15 YEARS OF MCMC: ITS IMPACT IN THE STATISTICAL (AND BROADER) RESEARCH COMMUNITY

In a non-technical vein, I will attempt, not a review of the development of MCMC theory and methodology, but rather, a review focused on the more brief involvement of the Bayesian community with MCMC and Gibbs sampling.

I will trace the heady, euphoric early days progressing to the current confident complacency! I will offer thoughts and anecdotes on early dissemination, the role of the probabilists, the revolution in the applied community, both for statisticians and scientists in other fields, landmark papers and contributions. Remarkably, we are witnessing Lindley's prophecy on a Bayesian 21st century coming to pass, to a certain extent, but in a way Dennis would not have imagined. I will conclude with a few challenges for the future.

ABSTRACT
Seminar by Alan E. Gelfand, 11:15 am, Blocker Room 457

STATIONARY PROCESS APPROXIMATION FOR THE ANALYSIS OF LARGE SPATIAL DATASETS

Spatial and spatio-temporal datasets are, increasingly, being collected in many areas of application, notably for meteorology, environmental exposure, ecological processes and disease incidence. In a typical spatial data analysis application, we build a hierarchical model with spatial structure described though random effects using a Gaussian process. If the sample size is very large, exact likelihood based inference becomes unstable and, eventually, infeasible since it involves computing quadratic forms and determinants associated with a large covariance matrix. If we wish to fit a Bayesian model, implementing a suitable MCMC algorithm, the large matrix will make repeated calculations impractical. A number of strategies for handling large spatial data sets have been discussed in the literature. After reviewing these, we propose a finite sum process approximation model for stationary processes, based upon a process representation that is conceptually simple and routine to implement. Simulated and real data examples are given to illustrate the method. Indeed, this approximation suggests a general form for building such approximations. We briefly discuss a particular choice which does not require a process representation and can accommodate arbitrary choices of covariance function. We conclude with a few comments on the potential limitations for inference, even with an arbitrarily large dataset.

EMANUEL AND CAROL PARZEN

Emanuel Parzen, Distinguished Professor of Statistics at Texas A&M, was born in New York City on April 21, 1929, and educated at Harvard (B.A. 1949) and University of California Berkeley (Ph.D. 1953). He has served as a Statistics faculty member at Columbia (1953-56), Stanford (1956-70), SUNY Buffalo (1970-1978), Texas A&M (1978-Present), and a visiting faculty at Imperial College London, M.I.T., IBM, Harvard, and the Center for Advanced Study in Behavioral Sciences. In 1994 he was awarded the Samuel S. Wilks Memorial Medal from the American Statistical Association with the following citation:

> *For outstanding research in Time Series Analysis, especially for his innovative introduction of reproducing kernel spaces, spectral analysis and spectrum smoothing; for pioneering contributions in quantile and density quantile functions and estimation; for unusually successful and influential textbooks in Probability and Stochastic Processes; for excellent and enthusiastic teaching and dissemination of statistical knowledge; and for a commitment to service on Society Councils, Government Advisory Committees and Editorial boards.*

Carol Parzen is an Aggie (M.S. 1981) and has had diverse careers in the community. She is retired (from her position as Assistant Director of the CBA Fellows Program in the College of Business Administration/Graduate School

of Business). Emanuel and Carol Parzen married in 1959 and have two children, Sara Schandelson (a librarian, resident of Boca Raton, Florida, and mother of three boys and two girls) and Michael Parzen (Associate Professor of Statistics, Goizueta Business School, Emory University, Atlanta Georgia, and father of one son).

PAST PARZEN PRIZE WINNERS

1994 Grace Wahba, Bascom Professor of Statistics
University of Wisconsin

1996 Donald B. Rubin, Professor of Statistics
Harvard University

1998 Bradley Efron, Professor of Statistics & Biostatistics
Stanford University

2000 C. R. Rao, Eberly Professor of Statistics
Pennsylvania State University

2002 David R. Brillinger, Professor of Statistics
University of California, Berkeley

2004 Jerome H. Friedman, Professor of Statistics
Stanford University

EMANUEL AND CAROL PARZEN FUND PRIZE FOR STATISTICAL INNOVATION

To promote the dissemination of statistical achievements, the Parzen Prize for Statistical Innovation is awarded (around April of even numbered years) to North American statisticians who have made outstanding and influential contributions to the development of applicable and innovative statistical methods. The prize has stimulated the establishment of other prestigious awards and prizes that recognize outstanding careers in the discipline and profession of statistics. Members of the Committee awarding the Prize for 2006 were Suojin Wang (Texas A&M), James H. Matis (Texas A&M), Bradley Efron (Stanford), Grace Wahba (University of Wisconsin), and William Schucany (Southern Methodist University).

The Parzen Prize for Statistical Innovation is supported by the Emanuel and Carol Parzen Fund, which was established as an endowment at the Texas A&M Development Foundation in honor of the 65th birthday on April 21, 1994 of Emanuel Parzen. Nominations for the year 2008 Parzen Prize should be submitted (by October 1, 2007) to Professor Suojin Wang, Statistics Department, Texas A&M University, College Station, TX, 77843-3143.

The Department of Statistics at Texas A&M University would like to express its appreciation to those who by their gifts support the Emanuel and Carol Parzen Fund at the Texas A&M Development Foundation. Contributors are listed on the Statistics Department website.