



JSM Activity #CE_18C

This is the preliminary program for the 2005 Joint Statistical Meetings in Minneapolis, Minnesota. Currently included in this program is the "technical" program, schedule of invited, topic contributed, regular contributed and poster sessions; Continuing Education courses (August 7-10, 2005); and Committee and Business Meetings. This on-line program will be updated frequently to reflect the most current revisions.

CE_18C

Mon, 8/8/05, 8:15 AM - 4:15 PM

MCC-L100 E

Computational Statistics: Methods for Optimization and Monte Carlo Integration - Continuing Education - Course

ASA, Section on Statistics and the Environment

Instructor(s): Jennifer A. Hoeting, Colorado State University, Geof Givens, Colorado State University

This course will consist of two parts: a morning session on Monte Carlo integration strategies and an afternoon session on optimization methods. We will survey a variety of techniques, ranging from classic to state-of-the-art. The course will be based on the book "Computational Statistics", by Givens and Hoeting (Wiley), which covers these and other topics in greater detail. Many problems in statistics require the evaluation of integrals that cannot be solved analytically, particularly in Bayesian statistics. In the morning session we will cover Monte Carlo integration, importance sampling and variance reduction techniques, and Markov chain Monte Carlo methods. Optimization also plays a central role in statistics, particularly in numerical maximum likelihood estimation. The afternoon session will focus on various optimization strategies including Newton-like methods, Gauss-Seidel iteration, tabu algorithms, simulated annealing, genetic algorithms, the EM algorithm and its variants. We seek to give students a practical understanding of how and why existing methods work, enabling students to use modern statistical methods effectively. Examples are drawn from diverse fields including bioinformatics, ecology, and medicine. The course is targeted for quantitative scientists and statisticians who are unfamiliar with these methods. Upper division undergraduate mathematical literacy is recommended. No computer programming experience is necessary. OPTIONAL TEXTBOOK AVAILABLE

JSM 2005 For information, contact jsm@amstat.org or phone (800) 308-8943. If you have questions about the Continuing Education program, please contact the [Education Department](#).
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