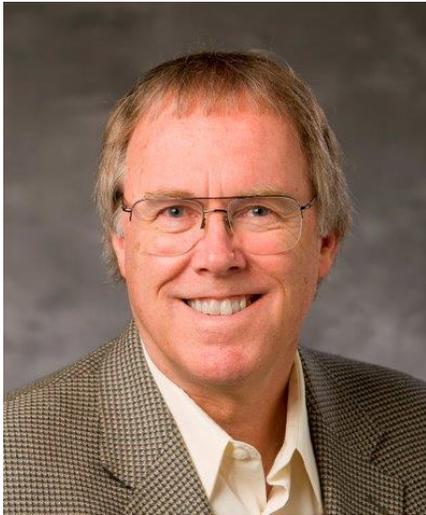


Department of Statistics Spring 2017 Colloquium Series
March 1st, 3:30 PM – 4:30 PM, Middlebush Hall 12



Speaker: Dr. James O. Berger is an American statistician. He received a Ph.D. in mathematics from Cornell in 1974. He was a faculty member in the Department of Statistics at Purdue University until 1997, at which time he moved to Duke University, where he is currently the Arts and Sciences Professor of Statistics. His research areas include Bayesian statistics, simulation, model selection, and various interdisciplinary areas of science and industry. He has received many notable awards in statistics for his work such as Guggenheim Fellowship in 1977, the COPSS Presidents' Award in 1985 and the R. A. Fisher Lectureship in 2001. He was elected to the USA National Academy of Sciences in 2003. He was the founding director of the Statistical and Applied Mathematical Sciences Institute, serving from 2002-2010.

An Objective Prior for Hyperparameters in Normal Hierarchical Models

Abstract: Hierarchical models are the workhorse of much of Bayesian analysis, yet there is uncertainty as to which objective priors to use for hyperparameters (parameters at higher levels of the hierarchical model). Formal approaches to objective Bayesian analysis, such as the Jeffreys-rule approach or reference prior approach, are only implementable in simple hierarchical settings (such as the one-way model). Thus it is common to use less formal approaches, such as utilizing formal priors from non-hierarchical models in hierarchical settings. This can be fraught with danger, however. For instance, non-hierarchical Jeffreys-rule priors for variances or covariance matrices result in improper posterior distributions if they are used at higher levels of a hierarchical model. Thus, such less formal approaches must be carefully evaluated, and not just from the perspective of posterior propriety.

Brown (1971) approached the question of choice of hyperpriors in normal hierarchical models by looking at the frequentist notion of admissibility of resulting estimators. The motivation was that hyperpriors that are too diffuse result in inadmissible estimators, while hyperpriors that are concentrated enough result in admissible estimators. Hyperpriors that are 'on the boundary of admissibility' are sensible choices for objective priors, being as diffuse as possible without resulting in inadmissible procedures.

In this talk, we propose a particular objective prior for use in all normal hierarchical models, based on considerations of admissibility, ease of implementation (including computational considerations), and performance. This is joint work with Prof. Dongchu Sun (University of Missouri) and Chengyuan Song (East China Normal University).