

UCLA

BIOSTATISTICS SEMINAR

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On the mixture characterization of non-local prior distributions and related posterior simulation algorithms. Applications to high dimensional variable selection.

Donatello Telesca, PhD

Harrington Faculty Fellow UT Austin, Department of Mathematics,
University of California Los Angeles, Department of Biostatistics

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3:30pm - 4:30pm, CHS 33-105A

Refreshments served at 3:00 PM in room 51-254 CHS

ABSTRACT: Non-local priors (NLPs) possess appealing properties for high-dimensional model choice, e.g. parsimony and consistency of posterior model probabilities. Their use for estimation has not yet been studied in detail, partially due to difficulties in characterizing the posterior on the parameter space. Here we give a general representation of NLPs as mixtures of truncated distributions. This enables simple posterior sampling and flexibly defining NLPs beyond previously proposed families. The studies show low serial correlation in posterior samples and notable estimation results. Linear model coefficient MSE for the model averaging posterior mean under NLPs is substantially lower MSE than SCAD/LASSO for spurious covariates, and comparable to SCAD for non-zero coefficients. Naive posterior intervals are substantially shorter than SCAD/LASSO bootstrap intervals while still exhibiting the desired frequentist coverage, suggesting a higher estimation efficiency. Overall, our findings enable the use of NLPs for estimation, contribute to their intuitive appeal and suggest important potential benefits in high-dimensional problems.