ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS
ΣΧΟΛΗ ΕΠΙΣΤΗΜΩΝ & ΤΕΧΝΟΛΟΓΙΑΣ ΤΗΣ ΠΛΗΡΟΦΟΡΙΑΣ
SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY
ΤΜΗΜΑ ΣΤΑΤΙΣΤΙΚΗΣ
DEPARTMENT OF STATISTICS

ΚΥΚΛΟΣ ΣΕΜΙΝΑΡΙΩΝ ΣΤΑΤΙΣΤΙΚΗΣ – ΜΑΙΟΣ 2016

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Scalable Bayesian variable selection and model averaging under block orthogonal design

ΤΕΤΑΡΤΗ 22/6/2016
13:15

ΑΙΘΟΥΣΑ 607, 6ος ΟΡΟΦΟΣ,
ΚΤΙΡΙΟ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ
(ΕΥΕΛΠΙΔΩΝ & ΛΕΥΚΑΔΟΣ)

ΠΕΡΙΛΗΨΗ

We show how to carry out fully Bayesian variable selection and model averaging in linear models with block-orthogonal design, that is when the Gram matrix is block-diagonal, with computational cost that scales linearly with the number of blocks. We provide algorithms that identify the most probable models of any given size without resorting to integration either by quadrature or Monte Carlo, and return all quantities of interest in Bayesian model averaging, such as variable inclusion probabilities and model averaged regression estimates by carrying out an one-dimensional numerical integration that is done adaptively using a novel scheme we introduce in this article. Our article extends previous work done for orthogonal designs, by allowing a fully Bayesian treatment of the residual variance, and introduces a completely novel framework for block-orthogonal designs, which we view as a computational approximation to real-life design matrices with clusters of correlated predictors.

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AUEB STATISTICS SEMINAR SERIES – MAY 2016

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Scalable Bayesian variable selection and model averaging under block orthogonal design

WEDNESDAY 22/6/2016
13:15

ROOM 607, 6th FLOOR,
POSTGRADUATE STUDIES BUILDING
(EVELPIDON & LEFKADOS)

ABSTRACT

We show how to carry out fully Bayesian variable selection and model averaging in linear models with block-orthogonal design, that is when the Gram matrix is block-diagonal, with computational cost that scales linearly with the number of blocks. We provide algorithms that identify the most probable models of any given size without resorting to integration either by quadrature or Monte Carlo, and return all quantities of interest in Bayesian model averaging, such as variable inclusion probabilities and model averaged regression estimates by carrying out an one-dimensional numerical integration that is done adaptively using a novel scheme we introduce in this article. Our article extends previous work done for orthogonal designs, by allowing a fully Bayesian treatment of the residual variance, and introduces a completely novel framework for block-orthogonal designs, which we view as a computational approximation to real-life design matrices with clusters of correlated predictors.