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SEMINARIO

"Wishart Distributions For Decomposable Graphs"

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Giovedì, 1 Febbraio 2007 – ore 16.30
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Abstract:

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When considering a graphical Gaussian model N_G Markov with respect to a decomposable graph G, the parameter space of interest for the precision parameter is the cone P_G of positive definite matrices with fixed zeros corresponding to the missing edges of G. The parameter space for the scale parameter of N_G is the cone Q_G, dual to P_G, of incomplete matrices with submatrices corresponding to the cliques of G being positive definite. We construct on the cones Q_G and P_G two families of Wishart distributions, namely the type I and type II Wisharts. They can be viewed as a generalization of the hyper Wishart and the inverse of the hyper inverse Wishart as defined by Dawid and Lauritzen (1993). The type I and II Wisharts have properties similar to those of the hyper and hyper inverse Wishart. Indeed, the inverse of the type II Wishart forms a conjugate family of priors for the covariance parameter of the graphical Gaussian model and is strong directed hyper Markov for every direction given to the graph by a perfect order of its cliques, while the type I Wishart is weak hyper Markov. Moreover, the inverse type II Wishart as a conjugate family presents the advantage of having a multi-dimensional shape parameter, thus offering flexibility for the choice of a prior. The type II Wishart can be viewed as the analog for graphical Gaussian model of the enriched conjugate prior defined by Consonni and Veronese (2003).
This is joint work with G. Letac.