Book of Abstracts

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:vels and the behaviour of their temporal trends. The efficacy of the methodology is established by a simulation study, and is illustrated by a of respiratory disease risk in Glasgow, Scotland.

5: Time-varying step change detection and forecasting in spatio-temporal areal data models

ıter: **Gavino Puggioni**, University of Rhode Island, United States

nethods are proposed that address some common issues in epidemiological studies: time varying step change detection in spatial autocorre-, and short and medium term forecast stability. The goal is to provide a flexible framework to identify and target areas with increased risk, inform early warning systems for risk surveillance. We present a flexible two stage space-time CAR model with Bayesian model averaging set of predictors, and a stochastic process that models variations in step-change boundaries. After testing the method in a simulation study, ply it to real data, and compare its forecasting performance with other commonly used methods.

88 Room B1 GRAPHICAL MARKOV MODELS I: MULTIVARIATE DEPENDENCE STRUCTURES Chair: Monia Lupparelli

: On the interpretation of path weights in undirected Markov random fields

ıter: **Alberto Roverato**, University of Bologna, Italy

thors: Robert Castelo

phical Gaussian models an undirected graph is used to represent the association structure of variables as a network, and if a pair of variables is ined by an edge in the graph, then the corresponding partial correlation is equal to zero. Although in graphical Gaussian models the structure network can be inferred from the zero pattern of the inverse covariance matrix, if the probability distribution of the variables is faithful to twork, then paths along the network connect random variables with non-zero entries in the covariance matrix. In the analysis of graphical ian models, it has been associated a weight with every path in the network and showed that the covariance between two variables can be ıted as the sum of the weights of all the paths joining the two variables. Path weights allow one to identify the relative contribution of a path value of the corresponding covariance. However, it is not clear either how to interpret the value of a single path or how to compare two paths lifferent endpoints. We provide an interpretation of the value taken by the weight of a path by decomposing it into a partial weight and an on factor. Furthermore, we identify a class of paths, called chordless paths, whose weights have a remarkably straightforward interpretation.

): Regression modelling with I-priors

ıter: **Wicher Bergsma**, London School of Economics, United Kingdom

prior modelling approach for regression with multiple, possibly multidimensional covariates, and with possible interaction effects, is intro-. The I-prior is a maximum entropy Gaussian prior for the regression function, with covariance function proportional to the Fisher information regression function. The proposed approach is a general, practical, methodology unifying a variety of models, including multilevel, varying :ient, longitudinal, and multidimensional or functional response models. In contrast to Gaussian process regression, a simple EM algorithm : constructed for I-prior models. This is especially important when there are many hyperparameters, when direct optimization of the marginal ıood may be difficult. The approach has high model parsimony, in particular for models involving many interaction effects. As a consequence ; model parsimony, we obtain a simple semi-Bayes methodology for selecting interaction effects. Whereas in previous approaches the re-:ing kernel Hilbert space framework was adequate, in the I-prior approach it is necessary to consider regression functions in a reproducing Krein space.

3: Multivariate dependence structures for ordinal data: A ϕ-divergence based approach

ıter: **Maria Kateri**, RWTH Aachen University, Germany

ıdence structures among ordinal variables will be studied in connection to ϕ-divergence measures. Log-linear models for ordinal classification les will be redefined through the Kullback-Leibler divergence and embedded in generalized families of models derived by replacing the ıck-Leibler by the ϕ-divergence. The scaling role of the ϕ-divergence in constructing models for ordinal data and its effect on describing derlying dependence structure will be discussed. The focus will be on high-dimensional contingency tables. Representative applications for ers of the ϕ-divergence based model families will be presented.

): Some issues on Bayesian analysis of binary bidirected graphs

ıter: **Claudia Tarantola**, University of Pavia, Italy

ian analysis of binary bidirected graphs has not been developed as much as traditional methods. No conjugate analysis is available and MCMC ds must be employed. The likelihood of the model cannot be analytically expressed as a function of the marginal log-linear interactions, but ı terms of the probability parameters. Hence, at each step of the MCMC an iterative procedure needs to be applied in order to calculate the obabilities and consequently the model likelihood. Finally, in order to have a well-defined model of marginal independence, the considered C algorithm should generate parameter values leading to a joint probability distribution with compatible marginals. We will present a novel C strategies that handles the previously discussed problems. A simulation study will be discussed.

26 Room D1 INSTRUMENTAL VARIABLES: THEORY AND APPLICATIONS Chair: Federico Crudu

: Errors-in-variables models with many proxies

ıter: **Federico Crudu**, University of Siena, Italy

el method is introduced to estimate linear models when explanatory variables are observed with error and many proxies are available. The ıcal Euclidean likelihood principle is used to combine the information that comes from the various mismeasured variables. We show that oposed estimator is consistent and asymptotically normal. In a Monte Carlo study we show that our method is able to efficiently use the ıation in the available proxies, both in terms of precision of the estimator and in terms of statistical power. An application to the effect of on crime suggests that measurement errors in the police variable induce substantial attenuation bias. Our approach, on the other hand, yields :stimates in absolute value with high precision, in accordance with the results put forward by the recent literature.

: Nonparametric instrumental estimation of additive models

ıter: **Samuele Centorrino**, Stony Brook University, United States

thors: Sorawoot Srisuma

-step estimator is proposed for nonparametric additive regression functions with multiple endogenous and exogenous conditioning variables. first step we construct a sieve nonparametric instrumental variable estimator that achieves the optimal rate of convergence in a minimax We smooth this over in the second step using kernel methods. The subsequent estimator has an asymptotic normal distribution and has an property. In particular, the asymptotic distribution of each additive component is the same as it would be if all the other components were ı.