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PREFACE

Editorial for the Special Issue PROBASTAT 2015

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The history of the PROBASTAT conference started over 40 years ago. At the beginning of the 1970s, a strong group of mathematical statisticians formed in Bratislava around Prof. Lubomír Kubáček. Subsequently, the idea to organize regular Slovak national conferences focused on probability and statistics has emerged in 1974, following the impulse of Prof. Andrej Pázman.

At the beginning of the 1990s, after the political climate in Czechoslovakia had changed, the opportunity to organize the first international conference, PROBASTAT 1991, was taken and a series of international PROBASTAT conferences followed in the years 1994, 1998, 2002, 2006, 2011 and 2015 at the congress centre of the Slovak Academy of Sciences, in the beautiful environment of the Smolenice castle. The seventh international conference on probability and statistics, PROBASTAT 2015, held on June 29th- July 3rd, 2015, was successfully continuing this tradition.

The conference was traditionally organized as a cooperation of the Institute of Measurement of the Slovak Academy of Sciences, Faculty of Mathematics, Physics and Informatics of the Comenius University in Bratislava and the Mathematical Institute of the Slovak Academy of Sciences. The members of the international organizing committee were led by Prof. Andrej Pázman, and the local organizing committee was led by Dr. Viktor Witkovský.

Eventually, the conference was attended by 84 participants from 18 countries, who provided 10 invited plenary talks, 37 contributed talks and 26 posters. The scientific program was organized into the four sections: regression and mixed models, optimum experimental design, dynamical statistical systems, and applied statistics. These

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sections also formed the pool of topics from which the contributions to this special issue were drawn. After a standard refereeing process, the following 14 papers were eventually selected for publication.

An interesting application on the discharge of silos is treated in the contribution by Amo-Salas et al. They compare several respective models from the literature and eventually employ KL-optimality for their discrimination.

The paper by Burclová and Pázman provides us with an embedding of a large number of design criteria into a linear programming framework. This will enable the utilization of fast existing linear programming algorithms for a variety of design problems. They also propose a useful extension into a (quasi-)Bayesian setting.

Kurtoğlu and Özkale introduce a first-order approximated Liu estimator to protect against multicollinearity in generalized linear models. They obtain necessary and sufficient condition for the superiority of the first-order approximated Liu estimator over the first-order approximated maximum likelihood estimator by the approximated mean squared error criterion.

LaMotte and Wells give a novel way of writing and interpreting inverse prediction in multivariate models as instances of general linear mixed models. This conveniently allows the user to employ standardly available software.

A model selection step in all scenarios applied within the framework of joinpoint regression considers only some limited set of alternatives, from which the final model is chosen. Maciak and Mizera present a different model estimation approach: the final model is selected out of all possible alternatives admitted by the data. The authors apply the L_1-regularization idea to identify significant joinpoint locations to construct the final model.

A simulation study about the probability weighted empirical characteristic function in tests of symmetry and goodness-of-fit is provided by Meintanis et al. They show that such tests, although they avoid arbitrary specification of weighting schemes, can often outperform more traditional ones without that advantage.

Milošević and Obradović propose a new class of goodness of fit tests for the exponential distribution. Based on the U-empirical Laplace transforms of equidistributed statistics, test statistics of the integral type are formed. Two families of exponentiality tests from this class are presented.

The contribution by Özkale addresses the adverse effects of multicollinearity in logistic regression. Alternatives to maximum likelihood estimation are studied of which the ridge estimator seems the superior choice.

Patrangenaru et al. analyze infinite dimensional projective shape data collected from digital camera images, focusing on two-sample hypothesis testing for both finite and infinite extrinsic mean configurations. The two sample test methodology is based on a Lie group technique. The authors apply available general results to the two sample problem for independent projective shapes of 3D facial configurations and for matched projective shapes of 2D and 3D contours.

Pešta proposes an extension of the total least squares estimator in the errors-in-variables models; the idea is to minimize a general unitarily invariant norm of the error matrix. Surprisingly, regardless of the chosen unitarily invariant matrix norm, the corresponding estimator is shown to coincide with the total least squares estimator.

Moreover, the estimator is proved to be scale invariant, interchange, direction, and rotation equivariant.

Pronzato et al. introduce some specific functionals characterizing dispersion in high dimensional distributions and study their maximizing measures. The approach can be employed in finding space-filling designs.

The article by Rosa and Harman presents methods of finding approximate designs in situation when the model is additive in the trial and nuisance effect. Eventually they utilize the simplex method of linear programming tools to construct respective exact designs. It must be noted that this submission has undergone a different refereeing process as the other papers in this volume. To avoid obvious conflicts of interest it was handled by an independently selected associate editor through general reviewing.

Sofronov considers a buying-selling problem with the finite time horizon when several stops of a sequence of independent random variables can be made. The objective is to find an optimal sequential procedure which maximizes the total expected revenue. The author obtains an optimal stopping rule and the value of a game.

Finally, Wichitsa-nguan et al. consider the maximum partial likelihood estimator for the Cox model with a general censoring distribution, general covariates, and an unknown baseline hazard rate. The authors derive conditions for estimability and asymptotic estimability. The asymptotic variance matrix of the maximum partial likelihood estimator is presented and its properties are discussed.

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