INTRODUCTION

The volume comprises papers presented at "The 23rd International Conference on Multivariate Statistical Analysis – MSA 2004". This conference was organized by the Chair of Statistical Methods of the University of Łódź and the Polish Statistical Association.

The field of the conference interest is very board, from the theoretical achievements in mathematical statistics to application in different branches of science, especially economics. The scientific programme of MSA 2004 covered a range of statistical problems, such as multivariate distributions, nonparametric inference, regression analysis, factor and cluster analysis, discrimination analysis, Monte Carlo analysis, Bayesian inference, stochastic processes, time series analysis and the application of statistical methods in social and economics researches.

The papers are divided into five thematic groups:
- Estimation and Regression Analysis,
- Statistical Tests,
- Classification Methods,
- Time Series Analysis and Other Topics,
- Applications of Statistical Methods.

The first group includes articles on various methods of estimation, particularly in regression models.

Wojciech Zieliński, in the papers *Interval Estimation of β in the Model* $y = x/\beta + \varepsilon$, $\beta > 0$. *I. Bayesian Approach* and *Estimating β in the Model* $y = x/\beta + \varepsilon$, $\beta > 0$. *II. Nonbayesian Approach* presented construction of intervals for β in the regression model $y = x/\beta + \varepsilon$, $\beta > 0$, $\varepsilon \sim N(0, \sigma^2)$. The author considered two cases: σ – known and σ – unknown.

The authors of the next paper, *Analysis of Linear Regression Model at Divided System Matrix*, Anna Budka, Wiesław Wagner, dealt with the analysis of 1-cut and m-cut linear regression models.

Aleksandra Baszczyńska, in the paper entitled *Some Nonparametric Estimators of Regression Function*, considered two nonparametric estimators of regression function: the Nadaraya–Watson and k-nearest neighbour estimator. The author presented properties of these estimators and possibilities of practical applications.

In the paper *Multiple Additive Regression Trees (MART) and their Application* by Joanna Trzęsiok, MART algorithm was studied. Apart from investigating accuracy the primary goal of the paper was investigating robustness.

In the next paper, *Estimation of Bias and Variance of Sample Median by Jackknife and Bootstrap Methods* by Krystyna Pruska, Monte Carlo analysis of properties of bias and variance estimators were presented. The sensitivity of the distribution of the sample median to the changes of sample size was investigated.

Grzegorz Kończak, in the paper *Joint Monitoring of The Mean, Dispersion and Asymmetry in Process Control*, considered the quadratic form of sample mean, sample variance and sample asymmetry. This statistic can be used for constructing a control chart for monitoring these three parameters in process control or in acceptance sampling by variables.

In the paper *Kriging – A Method of Statistic Interpolation of Spatial Data* by Jan Kowalik theoretical bases of the kriging method and possibilities of its application were presented.

The second section is devoted to statistical tests.

In the first paper *Verification of Hypotheses Concerning Parameters of the Regression Model for Complex Samples*, Czesław Domański considered the linear regression function $y = \beta x + \varepsilon$, where β is a vector of unknown parameters. The author dealt with verification of hypothesis of vector β in the case of complex samples. Results of simulation study indicated that verification hypothesis about this vector should be done using the modified F test.

In the paper entitled *On some Interential Procedures for Receiver Operating Characteristic Curves* by Agnieszka Rossa two significance tests for Receiver Operating Characteristic Curves are proposed. Both tests use the asymptotic χ^2 distribution of the test statistics.

Dariusz Parys, in the paper *Multiple Endpoints*, presented test procedures and their modifications for continuous and discrete endpoints.

The next author Dorota Pekasiewicz, in the paper *Sequential Tests with Power Equal to 1 for Chosen Location Parameters*, dealt with nonparametric sequential tests for the mean and median. These tests have important property, their power is equal to 1.

In the last paper in this section *About Phase Transitions in Kendall's Shape Space* by Daniel Kosiorowski, the choice of space shape, appropriate for describing an economic process was disscused. The author devoted special attention to the possibility of employing classical tests: the T^2 Hotelling test of the equality of the expected values and the Box's M test.

The next section, entitled "Classification Methods", starts with the contribution of Eugeniusz Gatnar *Feature Selection and Multiple Model Approach in Discriminant Analysis*. In this paper some problems of feature

selection for ensembles were considered. The author proposed a new correlation-based feature selection method combined with the wrapper approach.

Andrzej Dudek in the paper *Discrimination of Symbolic Objects* showed how classical Bayesian discrimination rule can be adapted to deal with data of different symbolic types. He described a general decision tree algorithm for the discrimination of symbolic data.

In the paper untitled *Comparative Assessment of Some Selected Methods of Determining the Number of Clusters in a Data Set* Jerzy Korzeniewski proposed a new algorithm of defining the number of clusters. The idea of this algorithm is based on the comparison of pseudo cumulative distribution functions of a certain random variable. The algorithm's performance was compared with other methods of determining the number of clusters.

Jarosław Michalak, in the paper *On the Application of Classification Trees to Analyze Customer Loyalty and Satisfaction*, presented an application of tree-structured models to analyze product properties influencing buying decision of the target group.

In the next paper *A Proposal for Using Selected Tree-Based Models to Identify Operative Risk Subgroups among Patients Undergoing Coronary Artery Bypass Grafting*, Małgorzata Misztal described selected tree-structured models with an application in medical diagnosis. Classification and logistic regression trees were used to identify risk factors associated with mortality and morbidity outcome among patients with Coronary Artery Discase treated surgically.

Iwona Gruszka, in the paper *The Rough Sets Approach to Multicriteria EU's Countries Classification Problem Based on Dominance Relation – the Probabilistic Characteristics of Decision Rules* presented the decision analysis of EU's countries classification problem for designing the decision model with dominance relation approach using the "4eMka" system.

The next author, Dorota Rozmus, in the paper untitled *Methods of Classification Error Decompositions and their Properties* dealt with the analysis of some properties of recently developed decompositions for 0-1 loss.

In the paper *On Some Modification of Support Vector Machines* by Michał Trzęsiok a comparison of the original support vector machines and its modification was presented.

The forth group of the papers "Time Series Analysis and Other Topics" consists of eight papers. Janusz Wywiał and Tomasz Żądło, in the paper *Jackknife Forecasts of Time Series* proposed a jacknife method to predict time series and to estimate precision of prediction. They presented some examples of forecasts of time series with seasonal fluctuations.

In the paper *GARCH Models of Time Series on DAM* by Alicja Ganczarek, an analysis of the time series on the Day Ahead Market of the Polish Power Exchange was presented.

Grażyna Trzpiot, in the paper *Multivalued Markov Processes* studied the regular selections and Markov selections for multivalued stochastic processes.

The next authors, Agnieszka Orwat and Grażyna Trzpiot, in the paper entitled *Dynamic Modellind of Values of Accounting Units of Open Pension Funds Using ARIMA Models* proposed specifications of sixteen models of values of accounting units of Open Pension Funds operating on the Polish financial market and discussed the quality of these models and their application to forecasting.

In the paper *The Average Price Dynamics – Continuous Time Deterministic Model* Jacek Białek defined a new index of the average price dynamics on a given time interval. The definition is based on a continuous time deterministic model.

Next two authors, Joanna Gerstenkorn and Tadeusz Gerstenkorn, in the paper *Probability of a Fuzzy Event. Review of Problems* gave an overview of problems connected with constructing the probability of fuzzy events and presented the idea of the Polish researcher S. Heilpern.

In the paper *Application of Latent Variable Models to Consumer Preference Analysis* by Andrzej Bąk, decompositional methods and models for analysing consumer preferences were characterized. The author presented latent variable models and their possible applications to preference analysis and their main applications to marketing research.

Małgorzata Graczyk, in the paper entitled *Optimum Chemical Balance Weighing Design with Positive Correlated Errors*, studied new methods of construction of the optimum chemical balance weighing design based on the set of incidence matrices of the ternary balanced block designs.

The last section, entitled "Applications of Statistical Methods", starts with the paper *The Role of Statistics in Survey Design in the Field of Social Sciences* by Mirosław Szreder. The role of prior information at different stages of the process of survey design is discussed in this paper. Statisticians are responsible not only for specifying areas where prior information can be used, but also for quantifying prior knowledge, and presenting opportunities for combining sample and non-sample knowledge in statistical surveys.

In the paper *Credit Decision Making Under Risk* Agata Szczukocka considered decision making problems classification with respect to type information possessed.

Adam Depta devoted his paper to *Selected Methods of Constructing Effective and Admissible Stocks Portfolios* and presented risk analysis of effective and admissible securities portfolios.

The authors of the next paper, *Effective Portfolio Construction as Multivariate Classification Problem*, Urszula Skórnik-Pokarowska and Arkadiusz Orłowski, studied portfolio based not only on the stock prices taxonomy

but also on economic indices as liquidity ratio, debt ratio and sales profitability ratio.

In the paper *Estimation of Seasonal Indices of Total and Infant Deaths in Poland Based on Standardized Data* by Zofia Mielecka-Kubień, the estimation of the parameters of a trend function and those of seasonal indices of total and infant deaths were presented. The author proposed applying data standardization to this estimation.

Joanna Majczak, in the paper *Some Considerations on Population Premature Mortality*, considered selected methods for analyzing population health and vitality applied in the World Health Organization researches are described, the ones which enable us to analyze population mortality from the point of view of the positive health definition – with special regard to premature mortality.

The authors, Andrzej Mantaj and Wiesław Wagner, in the paper *Comparative Analysis of Number Characteristics of Selected Social-Economic Characteristics of Communes of Podkarpackie Province* made an attempt to evaluate the behaviour of basic numerical one-dimensional characteristics and compared the compatibility of results of application of these characteristics.

In last paper *Selected Methods of Estimating Reserves for Unpaid Insurance Claims* by Anna Szymańska, two methods of determining the claims provisions were presented and compared.

Czesław Domański
Dorota Pekasiewicz