

Life and Work of Jana Jurečková: An Appreciation

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Abstract: Professor Jana Jurečková has extensively contributed to many areas in statistics and probability theory. Her contributions are highlighted here with reverent appreciation and admiration from all her colleagues, advisees as well as research collaborators.

Professor Jana Jurečková has extensively contributed to many areas in statistics and probability theory. This article is an appreciation of her work that draws on feedback from her colleagues, collaborators and advisees.

Jana (Přistoupilová) Jurečková was born on September 20, 1940, in Prague, Czechoslovakia. She spent a larger part of her childhood in Roudnice nad Labem (central Bohemia). She had her school and college education in Prague. She graduated (MSc.) from the Charles University at Prague in 1962, and earned her Ph.D. (CSc.) degree in Statistics in 1967 from the Czechoslovak Academy of Sciences. Her dissertation advisor was Professor Jaroslav Hájek and the principal theme of her thesis was R -estimation based on the uniform asymptotic linearity of linear rank statistics in the parameter of interest. This work not only provided a rigorous justification of asymptotics for rank estimators in linear models but also opened up a novel and elegant approach to the study of asymptotic properties of nonparametric tests and estimates. In later years Jana has tremendously expanded the domain of this basic theme far beyond linear rank statistics.

Professor Hájek was inspirational for career development of not only a number of his advisees but also of many other colleagues in Prague and abroad. All the three editors of this collection have benefited a lot from Professor Hájek's vision and his professional acumen. Jana was no less fortunate than others to join the Department of Probability and Mathematical Statistics at Faculty of Mathematics and Physics, Charles University in Prague, in 1964, even before her dissertation work was completed. It would be interesting to note that Professor Hájek formed a very active and bright group of researchers, including some outstanding women members in the Department of Probability and Mathematical Statistics, the Charles University in Prague, at a time when mathematical sciences used to have a far smaller representation of women researchers and teachers. With a deep sense of

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devotion and professional acumen Jana has been associated with her alma mater for more than forty-three years. In 1982 Jana passed her habilitation, in 1984 she defended her DrSc. scientific degree and, finally, in 1992 she was appointed by the president of Czechoslovakia to the rank of a full professors. At the present she holds a pivotal position at the Jaroslav Hájek Center of Theoretical and Applied Statistics, established under the auspices of the Ministry of Education, Czech Republic.

Jana has published extensively (more than 120 scientific articles), mostly, in the leading journals of statistics and probability theory and coauthored a number of monographs too. We enclose herewith Jana's list of publications. Her research interests cover a wide area of statistical inference, including (but not limited to):

- a) statistical procedures based on ranks;
- b) robust statistical procedures based on so called M-statistics and L-statistics;
- c) statistical procedures based on extreme sample observations;
- d) tail behavior and its application in statistics;
- e) asymptotic methods of mathematical statistics;
- f) finite sample behavior of estimates and tests.

During 1967–1976 her research attention mostly focused on nonparametrics, and the impact of Professor Hájek's outstanding research was well reflected in Jana's work. She realized a harder way to excel in research at the demise of Jaroslav Hájek in 1974, and undertook a much broader research field. She exploited in the late 1970's the relationship of R-, M- and L-estimators using the same uniform asymptotic linearity she developed in her dissertation. In collaboration with P. K. Sen, in 1981, she exploited the moment convergence of R-, L-, and M-estimators in a broader sequential context. Berry-Essen bounds for the normal approximation of the distribution of rank statistics were also studied in detail. Gradually, she become more interested in robust inference, and has contributed extensively in this field. Her research, some in collaboration with others, culminated in the 1996 Jurečková–Sen book. Regression rank scores and their use in statistical inference has been a favorite topic of research of Jana. Her work with Gutenbrunner, Portnoy and Koenker is specially noticeable. Moving beyond the independence assumption was a natural follow-up, and in that respect, in later years, her work with Hallin, Koul and others are noteworthy. Shrinkage estimation in a robust setup has also Jana's imprint from time to time. Quantile regression is another topic of Jana's research interest. Extreme value distributions and tail behavior of robust statistics have been extensively studied by Jana. In addition, she has always fathomed into adaptive robust inference and their computational aspects, later work with Jan Picek bearing this testimony.

Jana has co-edited a number of monographs, the most noteworthy was the first one in 1978: *Contributions to Statistics: Essays in memory of Jaroslav Hájek*. She has co-authored a number of monographs, some in an advanced level and some at intermediate levels with some emphasis on data analysis. All they are cited in the enclosed list of publications.

Jana has an impressive list of places where she has visited from time to time: University of North Carolina, Chapel Hill; University of Illinois at Urbana-Champaign; Université Libre de Bruxelles; Université P. Sabatier, Toulouse; Université de Neuchâtel; Carleton University in Ottawa, Limburgs University Center at Diepenbeek; Humboldt University in Berlin, University at Bordeaux, and University of Rome.

Jana can communicate well in Russian, French, German and English languages, in addition to her mother tongue. No wonder, she had collaborators from all the five continents and in diverse setups. Jana has a most impressive list of extensive

international research collaboration, including Pranab K. Sen (University of North Carolina), Roger Koenker and Stephen Portnoy (University of Illinois), Ehsanes Saleh (Carleton University, Ottawa), Marc Hallin (Université Libre de Bruxelles), Xavier Milhaud (University P. Sabatier, Toulouse), Hira Koul (Michigan State University), Yadolah Dodge (Université de Neuchâtel), Paul Janssen and Noël Veraverbeke (Hasselt University), Lev B. Klebanov (St. Petersburg, Charles University) and Keith Knight (University of Toronto) among others, as well as a number of her own advisees all over the world. She has long fruitful discussions with Abram M. Kagan (St. Petersburg, University of Maryland), Allan Welsh (The Australian National University), Witting (University of Freiburg) and Ivan Mizera (University of Alberta) among others. Note that Jana has supervised the doctoral dissertation of more than 15 advisees; the list is appended here. Many of them have proclaimed significant professional recognition.

Jana had important international collaborative research grants, co-sponsored by the Czech National Grant Agency, National Science Foundation in USA or NSERC in Canada.

Jana is an elected member of the International Statistical Institute, Fellow of the Institute of Mathematical Statistics, member of the Bernoulli Society (where she served in the council as well as its European regional committee). Since 2003 she is the elected fellow of the Learned Society of Czech Republic, the most prestigious Czech scientific society. During 2000, she was visiting Belgian Universities for six months under a Francqui Foundation distinguished faculty position.

She has served on the editorial board of a number of leading statistics journals, including *Annals of Statistics* (1992–1997), *Journal of the American Statistical Association* (2006–2008), *Sankhya* (2006–2011), *Sequential Analysis* (1982–2002), and *Statistics* (1980–1993). She has also served on the Review Panel of (US) NSF Grants and many other Research sponsoring agencies in Czech Republic and elsewhere. Jana has organized or co-organized a number of important international meetings. Let us mention a series of successful workshops on *Perspectives in Modern Statistical Inference* (1998, 2002, 2005), series of conferences on L_1 -statistical procedures (1987, 1992, 1997, 2002) and ICORS 2010 among others. With Jaromír Antoch and Tomáš Havránek Jana started very successful series of biennial conferences ROBUST at 1980 which impacted Czech Statistical Community in a profound way.

Even now Jana is as active, as energetic and as persuasive in basic research and professional development as in the time when she started her scientific career. We wish her a very long and even more prosperous life in future.

PH.D. GUIDANCE (co-adviser)

Served as the adviser and supervised the doctoral dissertations of the following persons at Charles University in Prague. (Cornelius Gutenbrunner at Freiburg University and Hana Kotoučková at Masaryk University, Brno).

Jaromír Antoch	Behavior of the Location Estimators from the Point of View of Large Deviations (adviser V. Dupač)	1982
Cornelius Gutenbrunner	Zur Asymptotik von Regression Quantil Prozessen und daraus abgeleiteten Statistiken	1985
Jan Hanousek	Robust Bayesian Type Estimators	1990
Marek Malý	The Asymptotics for Studentized k -step M -Estimators of Location	1991
Bohumír Procházka	Trimmed Estimates in the Nonlinear Regression Model	1992
Ivan Mizera	Weak Continuity and Identifiability of M -Functionals	1993
Jan Picek	Testing Linear Hypotheses Based on Regression Rank Scores	1996
Ivo Müller	Robust Methods in the Linear Calibration Model	1996
Jan Svatoš	M -estimators in Linear Model for Irregular Densities	2000
Alena Fialová	Estimating and Testing Pareto Tail Index	2001
Marek Omelka	Second Order Properties of some M - and R -estimators	2006
Martin Schindler	Inference Based on Regression Rank Scores	2008
Hana Kotoučková	History of Robust Mathematical-Statistical Methods	2009

MONOGRAPHS AND TEXTBOOKS

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