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Review

of the habilitation thesis with the title

“Diskrétne rozdelenia pravdepodobnosti a ich aplikácie v kvantitatívnej lingvistiky”

submitted by

Ján Mačutek

The applicant did research on properties of theoretical probability distributions and on their derivation using various approaches. This research was performed not only on a purely mathematical background but also in the context of projects in quantitative linguistics, where applications of – in the first line – discrete probability distributions form, alongside with ordinary functions and difference as well as differential equations, the major part of the theoretical models of linguistic phenomena in natural languages.

The submitted thesis and selected papers draw an impressive picture of the valuable mathematical work by Ján Mačutek. One of the aspects of this work which should be highlighted is his contribution to solve the problem of the correspondence of discrete and continuous distributions. He provided proofs which enable the researcher to switch from one model form to the other one. In general, linguistic data are of a discrete nature as the objects under study are discrete units such as texts, sentences, words, clauses, morphemes etc. Yet, there are also continuous properties such as syllable or sound duration, pitch, intensity etc. Moreover, models on a more abstract level predict mean values, variances etc., i.e. continuous quantities. And sometimes, a continuous model

may be more practical even if the data are discrete and vice versa. Mačutek's research in this field provides also a basis for a generalised use of Wimmer's and Altmann's "Unified theory".

Another valuable aspect of the work is the partial sums approach. The resulting derivations help to summarize modeling in quantitative linguistics.

I recommend the Faculty of Mathematics, Physics, and Informatics to accept Ján Mačutek's work as fully valid habilitation thesis.

Trier, 11 February 2013

(Prof. Dr. Reinhard Köhler)