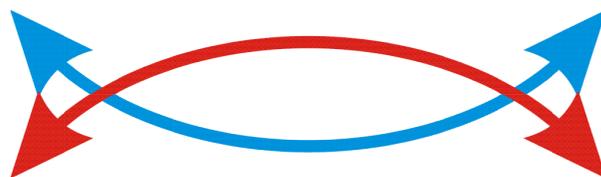


**Michel Deza, Michel Petitjean,  
Krassimir Markov (eds.)**

**Mathematics of Distances  
and  
Applications**



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The papers accepted and presented at the International Conference “Mathematics of Distances and Applications”, July 02-05, 2012, Varna, Bulgaria, are published in this book.

The concept of distance is basic to human experience. In everyday life it usually means some degree of closeness of two physical objects or ideas, i.e., length, time interval, gap, rank difference, coolness or remoteness, while the term metric is often used as a standard for a measurement. Except for the last two topics, the mathematical meaning of those terms, which is an abstraction of measurement, is considered. Distance metrics and distances have now become an essential tool in many areas of Mathematics and its applications including Geometry, Probability, Statistics, Coding/Graph Theory, Clustering, Data Analysis, Pattern Recognition, Networks, Engineering, Computer Graphics/Vision, Astronomy, Cosmology, Molecular Biology, and many other areas of science. Devising the most suitable distance metrics and similarities, to quantify the proximity between objects, has become a standard task for many researchers. Especially intense ongoing search for such distances occurs, for example, in Computational Biology, Image Analysis, Speech Recognition, and Information Retrieval.

For experts in the field of mathematics, information technologies as well as for practical users.

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## Foreword

This book consist of papers presented at the MDA 2012 International Conference on  
"Mathematics of Distances and Applications"  
held at Varna, Bulgaria, July 2-5, 2012.

<http://www.foibg.com/conf/ITA2012/2012mda.htm>

Several sessions were organized:

- Geometric complexity in aperiodic order, chaired by Michael Baake and Uwe Grimm
- Distances in probability, statistics and data analysis, chaired by Ernst Gabidulin
- Distances in behavioral, life, and physical sciences, chaired by Ehtibar Dzhafarov and Michel Petitjean
- Discrete geometry, combinatorics, and distances, chaired by Norman Johnson and Asia Weiss
- Distances in graphs, chaired by Egon Schulte
- Coding theory, chaired by Nina Pilipchuk

Although a wide diversity of distances related topics were considered, the set of papers consists of approximately equal two parts with mostly theoretical and mostly applied papers, even if the division is approximative also. The papers were submitted to an anonymous peer review process. The managing of this process was done with the session organizers and with the kind help of the members of the Programme Committee: Tetsuo Asano, Michael Baake, Stefan Dodunekov, Ehtibar Dzhafarov, Ernst Gabidulin, Uwe Grimm, Vladimir Gurvich, Sandi Klavzar, Jacobus Koolen, Svetlozar Rachev, Egon Schulte, Sergey Shpectorov, Kokichi Sugihara, Koen Vanhoof, Cedric Villani.

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Michel Deza (France)  
Michel Petitjean (France)  
Krassimir Markov (Bulgaria)

