

Die Reihe

Biometrie und Medizinische Informatik Greifswalder Seminarberichte

wird herausgegeben von:

*Universitätsprofessor Dr. rer. nat. habil. Karl-Ernst Biebler
und Dr. rer. nat. Bernd Jäger*

Institut für Biometrie und Medizinische Informatik der
Ernst-Moritz-Arndt-Universität Greifswald
Rathenaustraße 48
17487 Greifswald

Anliegen der Greifswalder Seminarberichte Biometrie und Medizinische Informatik ist es, die Zusammenarbeit im Berührungsfeld von Medizin, Biowissenschaften, Mathematik und Informatik zu fördern. In diesem Sinne steht die Mitarbeit an den Publikationen allen denen offen, die sich einer solchen Vermittlung zwischen den Wissenschaften verpflichtet fühlen und die dazu einen Beitrag leisten wollen.

**Statistical and Biometrical Challenges:
Theory and Applications**

Teresa Oliveira
Karl-Ernst Biebler
Amílcar Oliveira
Bernd Jäger
(Editors)

Biometrie und medizinische Informatik - Greifswalder
Seminarberichte

**Teresa Oliveira,
Karl-Ernst Biebler,
Amílcar Oliveira,
Bernd Jäger
(Ed.)**

Statistical and Biometrical Challenges

Theory and Applications

Shaker Verlag
Aachen 2014

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de>.

Copyright Shaker Verlag 2014

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the publishers.

Printed in Germany.

ISBN 978-3-8440-2680-1

ISSN 1439-5320

Shaker Verlag GmbH • P.O. BOX 101818 • D-52018 Aachen

Phone: 0049/2407/9596-0 • Telefax: 0049/2407/9596-9

Internet: www.shaker.de • e-mail: info@shaker.de

CONTENTS

Introduction	1
Weighted Generalized Affinity Coefficient: Applications in the Field of Biometry	
Áurea Sousa, Helena Bacelar-Nicolau, Fernando C. Nicolau, Osvaldo Silva.....	7
Pharmacokinetics: ODE and statistical model choice	
Karl-Ernst Biebler and Michael Wodny.....	25
Applicability of the Weibull distribution and its extensions in the biosciences	
Chrys Caroni.....	53
New realistic methodology to model the extremes value	
Joan del Castillo, Isabel Serra.....	67
Distribution View: a tool to write and simulate distributions	
J. Silva Coelho, Fernando Branco, T. Azinheira Oliveira	75
Statistical Modelling: study of cardiovascular profile of asymptomatic adults, from Benguela	
Ana G. Cunha, Teresa A. Oliveira, Pedro C. Pires.....	99
Inference in a three way crossed linear random model	
Dario Ferreira, Sandra Ferreira, Célia Nunes, João T. Mexia	115
Vec type operators and adjusting models for symmetric stochastic matrices	
Dina Salvador and J.Tiago Mexia	127
Parameter Dependence as ‘Weak Transformation’; Method of Construction of Multivariate Probability Densities	
Jerzy Filus, Lidia Filus	133

Fractal Case Study for Mammary Cancer	
Philipp Hermann, Sarah Piza, Sandra Ruderstorfer, Sabine Spreitzer-Gröbner, Milan Stehlík.....	149
Wealth and Portfolios of the Elderly: Evidence and Econometric Analysis based on the Cyprus Survey of Consumer Finances	
A. Karagrigoriou, I. Vonta	167
A Min-Max Entropy Algorithm for Relative Risk Problems	
Christos P. Kitsos, Thomas L. Toulías	191
Statistical Invariance for the Logit and Probit Models	
Christos P. Kitsos, Thomas L. Toulías, Effie Papageorgiou	203
On Response Surface Models	
Conceição Leal, Teresa Oliveira, Amílcar Oliveira	217
Statistical Inference for Multi-State Systems	
A. Makrides and A. Karagrigoriou	241
Experimental Design as Tool on Adjusting the Parameters of Metaheuristics	
Andreia Monteiro, Angel A. Juan and Teresa A. Oliveira	259
Statistical Modeling and Forecasting in Time Series Extremes	
Maria Manuela Neves, Clara Cordeiro.....	277
Statistical Modeling and Inference in Extremes: Applications with R	
Helena Penalva, Sandra Nunes, Manuela Neves.....	281
The Almost sure convergence of the Elitist Non-homogeneous Genetic Algorithm when SA algorithms are used in selection, crossover and/or mutation stages	
André G.C. Pereira, Viviane S.M. Campos.....	311