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gave during my time at the Westfalische¨ Wilhelms–Universitat¨ in Munster¨ . It was planned as a successor of Springer Lecture Notes in Mathematics 1407. H- ever, when preparing it, I decided to also include material which has not been treated in SLN 1407. Since the appearance of SLN 1407 many innovations in the area of - dinal analysis have taken place. Just to mention those of them which are addressed in this book: Buchholz simpli?ed local predicativity by the invention of operator controlled derivations (cf. Chapter 9, Chapter 11); Weiermann detected applications of methods of impredicative proof theory to the characterization of the provable recursive functions of predicative theories (cf. Chapter 10); Beckmann improved Gentzen's boundedness theorem (which appears as Stage Theorem (Theorem 6. 6. 1) in this book) to Theorem 6. 6. 9, a theorem which is very satisfying in itself - though its real importance lies in the ordinal analysis of systems, weaker than those treated here. Besides these innovations I also decided to include the analysis of the theory (? –REF) as an example of a subtheory of set theory whose ordinal analysis only 2 0 requires a ?rst step into impredicativity. The ordinal analysis of(? –FXP) of non- 0 1 0 monotone? –de?nable inductive de?nitions in Chapter 13 is an application of the 1 analysis of(? –REF).

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TOOLS FOR COMPUTATIONAL FINANCE

Springer Science & Business Media **This edition contains more material. The largest addition is a new section on jump processes (Section 1.9). The derivation of a related partial integro differential equation is included in Appendix A3.**

More material is devoted to Monte Carlo simulation. An algorithm for the standard workhorse of in verting the normal distribution is added to Appendix A7. New figures and more exercises are intended to improve the clarity at some places. Several further references give hints on more advanced material and on important developments. Many small changes are hoped to improve the readability of this book. Further I have made an effort to correct misprints and errors that I knew about. A new domain is being prepared to serve the needs of the computational finance community, and to provide complementary material to this book. The address of the domain is www.compfin.de The domain is under construction; it replaces the website address www . mi. uni koeln.de/numerik/compfin/. Suggestions and remarks both on this book and on the domain are most welcome.

COMPREHENSIVE MATHEMATICS FOR COMPUTER SCIENTISTS 1

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USING THE BORSUK-ULAM THEOREM

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called equivariant methods, based on the Borsuk-Ulam theorem and its generalizations. The topological tools are intentionally kept on a very elementary level. No prior knowledge of algebraic topology is assumed, only a background in undergraduate mathematics, and the required topological notions and results are gradually explained.

ALGEBRAIC COMBINATORICS

LECTURES AT A SUMMER SCHOOL IN NORDFJORDEID, NORWAY, JUNE 2003

Springer Science & Business Media **Each year since 1996 the universities of Bergen, Oslo and Trondheim have organized summer schools in Nordfjordeid in various topics in algebra and related ?elds. Nordfjordeid is the birthplace of Sophus Lie, and is a village on the western coast of Norway situated among fjords and mountains, with sp- tacularscenerywhereveryougo. AssuchitisawelcomeplaceforbothNor- gian and international participants and lecturers. The theme for the summer school in 2003 was Algebraic Combinatorics. The organizing committee c- sisted of Gunnar Fløystad and Stein Arild Strømme (Bergen), Geir Ellingsrud and Kristian Ranestad (Oslo), and Alexej Rudakov and Sverre Smalø (Tro- heim). The summer school was partly ?nanced by NorFa-Nordisk Forsker- danningsakademi. With combinatorics reaching into and playing an important part of ever more areas in mathematics, in particular algebra, algebraic combinatorics was a timely theme. The ?st lecture series “Hyperplane arrangements” was given by Peter Orlik. He came as a refugee to Norway, eighteen years old, after the insurrection in Hungary in 1956. Despite now having lived more than four decades in the United States, he impressed us by speaking ?uent Norwegian without a trace of accent. The second lecture series “Discrete Morse theory and free resolutions” was given by Volkmar Welker. These two topics ori- nate back in the second half of the nineteenth century with simple problems on arrangements of lines in the plane and Hilberts syzygy theorem.**

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AN INTRODUCTION

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has been updated and extensively revised. Several new topics have been included, such as a chapter on credit risk management.

INTRODUCTION TO MATHEMATICAL METHODS IN BIOINFORMATICS

Springer **This book looks at the mathematical foundations of the models currently in use. All existing books on bioinformatics are software-orientated and they concentrate on computer implementations of mathematical models of biology. This book is unique in the sense that it looks at the mathematical foundations of the models, which are crucial for correct interpretation of the outputs of the models.**

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GENERAL THEORY OF STATISTICS

Fultus Corporation **Book Description The present book is a statistical course for undergraduate students in all fields of social and economic sciences. The book presents a manual on the course "General Theory of Statistics", including a**

series of not quite traditional topics. First of all, it concerns the mathematical bases of statistics and use of computer technologies in statistical probing. Thematic choice of the chapters and sections of the book is caused not only by interests and tastes of the authors, but also by modern tendencies in applied statistics and orientation of the given work. The book is based on a course of lectures given by the first author for undergraduates in social and economic sciences along with three books published in Russian and English in Estonia, Lithuania and Byelorussia. This book has been written for a large enough audience of teachers, researchers, statisticians, students, collegians and users of statistics in behavioral and social sciences. Above all, the book is directed to a wide circle of the readers studying statistical disciplines in high schools and colleges; however, it can be useful also to persons independently studying statistics. Author Biography (Aladjev V.Z.) Professor Aladjev V.Z. was born on June 14, 1942 in the town Grodno (Byelorussia). Now, he is the First vice-president of the International Academy of Noosphere and the president of Tallinn Research Group, whose scientific results have received international recognition, first, in the field of mathematical theory of Cellular Automata (CA). He is member of a series of Russian and International Academies. Aladjev V. Z. is the author of more than 330 scientific publications, including 63 books, published in many countries. He participates as a member of the organizing committee and/or a guest lecturer in many international scientific forums in mathematics and cybernetics. Author Biography (Haritonov V.N.) Dr. Haritonov V.N. was born on August 2, 1946 in the town Nizhni Novgorod (Russia). On successful graduation from Tallinn Technical University, he has acquired a profession of economics. Since 1972, Haritonov V.N. has the respectable positions in the Estonian banking system. Now, he is the Chairman of the Board of Tallinn Business Bank. Most considerable methodological projects and practical results of Haritonov V.N. are related to economic sciences, and, above all, to banking field, including automation of banking system, banking statistics, etc. Along with a series of publications, Haritonov V.N. has participated in many scientific and applied forums on banking economics.

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John Wiley & Sons **A one–of–a–kind guide to using deterministic and probabilistic methods for solving problems in the biological sciences Highlighting the growing relevance of quantitative techniques in scientific research, Mathematical Methods in Biology provides an accessible presentation of the broad range of important mathematical methods for solving problems in the biological sciences. The book reveals the growing connections between mathematics and biology through clear explanations and specific, interesting problems from areas such as population dynamics, foraging theory, and life history theory. The authors begin with an introduction and review of mathematical tools that are employed in subsequent chapters, including biological modeling, calculus, differential equations, dimensionless variables, and descriptive statistics. The following chapters examine standard discrete and continuous models using matrix algebra as well as difference and differential equations. Finally, the book outlines probability, statistics, and stochastic methods as well as material on bootstrapping and stochastic differential equations, which is a unique approach that is not offered in other literature on the topic. In order to demonstrate the application of mathematical methods to the biological sciences, the authors provide focused examples from the field of theoretical ecology, which serve as an accessible context for study while also demonstrating mathematical skills that are applicable to many other areas in the life sciences. The book′s algorithms are illustrated using MATLAB®, but can also be replicated using other software packages, including R, Mathematica®, and Maple; however, the text does not require any single computer algebra package. Each chapter contains numerous exercises and problems that range in difficulty, from the basic to more challenging, to assist readers with building their problem–solving skills. Selected solutions are included at the back of the book, and a related Web site features supplemental material for further study. Extensively class–tested to ensure an easy–to–follow format, Mathematical Methods in Biology is an excellent book for mathematics and biology courses at the upper–undergraduate and graduate levels. It also serves as a valuable reference for researchers and professionals working in the fields of biology, ecology, and biomathematics.**

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