FREE ACCESS CONCENTRATION OF MEASURE FOR THE ANALYSIS OF RANDOMIZED ALGORITHMS

Concentration of Measure for the Analysis of Randomized Algorithms

Randomized algorithms have become a central part of the algorithms curriculum, based on their increasingly widespread use in modern applications. This book presents a coherent and unified treatment of probabilistic techniques for obtaining high probability estimates on the performance of randomized algorithms. It covers the basic toolkit from the Chernoff–Hoeffding bounds to more sophisticated techniques like martingales and isoperimetric inequalities, as well as some recent developments like Talagrand's inequality, transportation cost inequalities and log-Sobolev inequalities. Along the way, variations on the basic theme are examined, such as Chernoff–Hoeffding bounds in dependent settings. The authors emphasise comparative study of the different methods, highlighting respective strengths and weaknesses in concrete example applications. The exposition is tailored to discrete settings sufficient for the analysis of algorithms, avoiding unnecessary measure-theoretic details, thus making the book accessible to computer scientists as well as probabilists and discrete mathematicians.

Concentration of Measure for the Analysis of Randomized Algorithms

This book presents a coherent and unified account of classical and more advanced techniques for analyzing the performance of randomized algorithms.

Handbook of randomized computing. 1

Concentration inequalities for functions of independent random variables is an area of probability theory that has witnessed a great revolution in the last few decades, and has applications in a wide variety of areas such as machine learning, statistics, discrete mathematics, and high-dimensional geometry. Roughly speaking, if a function of many independent random variables does not depend too much on any of the variables then it is concentrated in the sense that with high probability, it is close to its expected value. This book offers a host of inequalities to illustrate this rich theory in an accessible way by covering the key developments and applications in the field. The authors describe the interplay between the probabilistic structure (independence) and a variety of tools ranging from functional inequalities to transportation arguments to information theory. Applications to the study of empirical processes, random projections, random matrix theory, and threshold phenomena are also presented. A self-contained introduction to concentration inequalities, it includes a survey of concentration of sums of independent random variables, variance bounds, the entropy method, and the transportation method. Deep connections with isoperimetric problems are revealed whilst special attention is paid to applications to the supremum of empirical processes. Written by leading experts in the field and containing extensive exercise sections this book will be an invaluable resource for researchers and graduate students in mathematics, theoretical computer science, and engineering.

Concentration Inequalities

This book constitutes the refereed proceedings of the International Conference on the Applications of Evolutionary Computation, EvoApplications 2013, held in Vienna, Austria, in April 2013, colocated with the

Evo* 2013 events EuroGP, EvoCOP, EvoBIO, and EvoMUSART. The 65 revised full papers presented were carefully reviewed and selected from 119 submissions. EvoApplications 2013 consisted of the following 12 tracks: EvoCOMNET (nature-inspired techniques for telecommunication networks and other parallel and distributed systems), EvoCOMPLEX (evolutionary algorithms and complex systems), EvoENERGY (evolutionary computation in energy applications), EvoFIN (evolutionary and natural computation in finance and economics), EvoGAMES (bio-inspired algorithms in games), EvoIASP (evolutionary computation in image analysis, signal processing, and pattern recognition), EvoINDUSTRY (nature-inspired techniques in industrial settings), EvoNUM (bio-inspired algorithms for continuous parameter optimization), EvoPAR (parallel implementation of evolutionary algorithms), EvoRISK (computational intelligence for risk management, security and defence applications), EvoROBOT (evolutionary computation in robotics), and EvoSTOC (evolutionary algorithms in stochastic and dynamic environments).

Applications of Evolutionary Computing

The two-volume set LNCS 9134 and LNCS 9135 constitutes the refereed proceedings of the 42nd International Colloquium on Automata, Languages and Programming, ICALP 2015, held in Kyoto, Japan, in July 2015. The 143 revised full papers presented were carefully reviewed and selected from 507 submissions. The papers are organized in the following three tracks: algorithms, complexity, and games; logic, semantics, automata, and theory of programming; and foundations of networked computation: models, algorithms, and information management.

Automata, Languages, and Programming

This book constitutes the refereed conference proceedings of the 12th International Conference on Algorithms and Complexity, CIAC 2019, held as a virtual event, in May 2021. The 28 full papers presented together with one invited lecture and 2 two abstracts of invited lectures were carefully reviewed and selected from 78 submissions. The International Conference on Algorithms and Complexity is intended to provide a forum for researchers working in all aspects of computational complexity and the use, design, analysis and experimentation of efficient algorithms and data structures. The papers present original research in the theory and applications of algorithms and computational complexity. Due to the Corona pandemic the conference was held virtually.

Algorithms and Complexity

This book constitutes the thoroughly refereed proceedings of the 21st International Symposium on Static Analysis, SAS 2014, held in Munich, Germany, in September 2014. The 20 revised full papers were selected from 53 submissions and are presented together with 3 invited talks. The papers address all aspects of static analysis, including abstract interpretation, abstract testing, bug detection, data flow analysis, model checking, program transformation, program verification, security analysis, and type checking.

Static Analysis

Delineating the tremendous growth in this area, the Handbook of Approximation Algorithms and Metaheuristics covers fundamental, theoretical topics as well as advanced, practical applications. It is the first book to comprehensively study both approximation algorithms and metaheuristics. Starting with basic approaches, the handbook presents the methodologies to design and analyze efficient approximation algorithms for a large class of problems, and to establish inapproximability results for another class of problems. It also discusses local search, neural networks, and metaheuristics, as well as multiobjective problems, sensitivity analysis, and stability. After laying this foundation, the book applies the methodologies to classical problems in combinatorial optimization, computational geometry, and graph problems. In addition, it explores large-scale and emerging applications in networks, bioinformatics, VLSI, game theory, and data analysis. Undoubtedly sparking further developments in the field, this handbook provides the

essential techniques to apply approximation algorithms and metaheuristics to a wide range of problems in computer science, operations research, computer engineering, and economics. Armed with this information, researchers can design and analyze efficient algorithms to generate near-optimal solutions for a wide range of computational intractable problems.

Handbook of Approximation Algorithms and Metaheuristics

Introduces exciting new methods for assessing algorithms for problems ranging from clustering to linear programming to neural networks.

Beyond the Worst-Case Analysis of Algorithms

This book constitutes the refereed proceedings of the 9th International Conference on Interactive Theorem Proving, ITP 2018, held in Oxford, UK, in July 2018. The 32 full papers and 5 short papers presented were carefully reviewed and selected from 65 submissions. The papers feature research in the area of logical frameworks and interactive proof assistants. The topics include theoretical foundations and implementation aspects of the technology, as well as applications to verifying hardware and software systems to ensure their safety and security, and applications to the formal verication of mathematical results. Chapters 2, 10, 26, 29, 30 and 37 are available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

Interactive Theorem Proving

For many applications a randomized algorithm is either the simplest algorithm available, or the fastest, or both. This tutorial presents the basic concepts in the design and analysis of randomized algorithms. The first part of the book presents tools from probability theory and probabilistic analysis that are recurrent in algorithmic applications. Algorithmic examples are given to illustrate the use of each tool in a concrete setting. In the second part of the book, each of the seven chapters focuses on one important area of application of randomized algorithms: data structures; geometric algorithms; graph algorithms; number theory; enumeration; parallel algorithms; and on-line algorithms. A comprehensive and representative selection of the algorithms in these areas is also given. This book should prove invaluable as a reference for researchers and professional programmers, as well as for students.

Randomized Algorithms

This book provides a practical and fairly comprehensive review of Data Science through the lens of dimensionality reduction, as well as hands-on techniques to tackle problems with data collected in the real world. State-of-the-art results and solutions from statistics, computer science and mathematics are explained from the point of view of a practitioner in any domain science, such as biology, cyber security, chemistry, sports science and many others. Quantitative and qualitative assessment methods are described to implement and validate the solutions back in the real world where the problems originated. The ability to generate, gather and store volumes of data in the order of tera- and exo bytes daily has far outpaced our ability to derive useful information with available computational resources for many domains. This book focuses on data science and problem definition, data cleansing, feature selection and extraction, statistical, geometric, information-theoretic, biomolecular and machine learning methods for dimensionality reduction of big datasets and problem solving, as well as a comparative assessment of solutions in a real-world setting. This book targets professionals working within related fields with an undergraduate degree in any science area, particularly quantitative. Readers should be able to follow examples in this book that introduce each method or technique. These motivating examples are followed by precise definitions of the technical concepts required and presentation of the results in general situations. These concepts require a degree of abstraction that can be followed by re-interpreting concepts like in the original example(s). Finally, each section closes with solutions to the original problem(s) afforded by these techniques, perhaps in various ways to compare

and contrast dis/advantages to other solutions.

Dimensionality Reduction in Data Science

This book presents the original articles that have been accepted in the 2019 INNS Big Data and Deep Learning (INNS BDDL) international conference, a major event for researchers in the field of artificial neural networks, big data and related topics, organized by the International Neural Network Society and hosted by the University of Genoa. In 2019 INNS BDDL has been held in Sestri Levante (Italy) from April 16 to April 18. More than 80 researchers from 20 countries participated in the INNS BDDL in April 2019. In addition to regular sessions, INNS BDDL welcomed around 40 oral communications, 6 tutorials have been presented together with 4 invited plenary speakers. This book covers a broad range of topics in big data and deep learning, from theoretical aspects to state-of-the-art applications. This book is directed to both Ph.D. students and Researchers in the field in order to provide a general picture of the state-of-the-art on the topics addressed by the conference.

Recent Advances in Big Data and Deep Learning

This three-volume set LNAI 8724, 8725 and 8726 constitutes the refereed proceedings of the European Conference on Machine Learning and Knowledge Discovery in Databases: ECML PKDD 2014, held in Nancy, France, in September 2014. The 115 revised research papers presented together with 13 demo track papers, 10 nectar track papers, 8 PhD track papers, and 9 invited talks were carefully reviewed and selected from 550 submissions. The papers cover the latest high-quality interdisciplinary research results in all areas related to machine learning and knowledge discovery in databases.

Machine Learning and Knowledge Discovery in Databases

Systematically teaches key paradigmic algorithm design methods Provides a deep insight into randomization

Design and Analysis of Randomized Algorithms

Learn about probability as it is used in computer science with this rigorous, yet highly accessible, undergraduate textbook. Fundamental probability concepts are explained in depth, prerequisite mathematics is summarized, and a wide range of computer science applications is described. Throughout, the material is presented in a "question and answer" style designed to encourage student engagement and understanding. Replete with almost 400 exercises, real-world computer science examples, and covering a wide range of topics from simulation with computer science workloads, to statistical inference, to randomized algorithms, to Markov models and queues, this interactive text is an invaluable learning tool whether your course covers probability with statistics, with stochastic processes, with randomized algorithms, or with simulation. The teaching package includes solutions, lecture slides, and lecture notes for students.

Introduction to Probability for Computing

Exact algorithms for dealing with geometric objects are complicated, hard to implement in practice, and slow. Over the last 20 years a theory of geometric approximation algorithms has emerged. These algorithms tend to be simple, fast, and more robust than their exact counterparts. This book is the first to cover geometric approximation algorithms in detail. In addition, more traditional computational geometry techniques that are widely used in developing such algorithms, like sampling, linear programming, etc., are also surveyed. Other topics covered include approximate nearest-neighbor search, shape approximation, coresets, dimension reduction, and embeddings. The topics covered are relatively independent and are supplemented by exercises. Close to 200 color figures are included in the text to illustrate proofs and ideas.

Geometric Approximation Algorithms

The first volume of this popular handbook mirrors the modern taxonomy of computer science and software engineering as described by the Association for Computing Machinery (ACM) and the IEEE Computer Society (IEEE-CS). Written by established leading experts and influential young researchers, it examines the elements involved in designing and implementing software, new areas in which computers are being used, and ways to solve computing problems. The book also explores our current understanding of software engineering and its effect on the practice of software development and the education of software professionals.

Computing Handbook

Understanding the behavior of basic sampling techniques and intrinsic geometric attributes of data is an invaluable skill that is in high demand for both graduate students and researchers in mathematics, machine learning, and theoretical computer science. The last ten years have seen significant progress in this area, with many open problems having been resolved during this time. These include optimal lower bounds for epsilon-nets for many geometric set systems, the use of shallow-cell complexity to unify proofs, simpler and more efficient algorithms, and the use of epsilon-approximations for construction of coresets, to name a few. This book presents a thorough treatment of these probabilistic, combinatorial, and geometric methods, as well as their combinatorial and algorithmic applications. It also revisits classical results, but with new and more elegant proofs. While mathematical maturity will certainly help in appreciating the ideas presented here, only a basic familiarity with discrete mathematics, probability, and combinatorics is required to understand the material.

Sampling in Combinatorial and Geometric Set Systems

This book constitutes the proceedings of the 15th International Symposium on Algorithmic Game Theory, SAGT 2022, which took place in Colchester, UK, in September 2022. The 31 full papers included in this book were carefully reviewed and selected from 83 submissions. They were organized in topical sections as follows: Auctions, markets and mechanism design; computational aspects in games; congestion and network creation games; data sharing and learning; social choice and stable matchings.

Algorithmic Game Theory

This book constitutes the refereed conference proceedings of the 28th International Colloquium on Structural Information and Communication Complexity, SIROCCO 2021, held in Wroc?aw, Poland, in June 2021. Due to COVID-19, the conference will be held online. The 20 full papers presented in this book were carefully reviewed and selected from 48 submissions. The papers are solicited from all areas of study of local structural knowledge and global communication and computational complexities. Among the typical areas are distributed computing, communication networks, game theory, parallel computing, social networks, mobile computing

Structural Information and Communication Complexity

This book constitutes the refereed proceedings of the 17th International Conference on Information Security, ISC 2014, held in Hong Kong, China, in October 2014. The 20 revised full papers presented together with 16 short papers and two invited papers were carefully reviewed and selected from 106 submissions. The papers are organized in topical sections on public-key encryption, authentication, symmetric key cryptography, zero-knowledge proofs and arguments, outsourced and multi-party computations, implementation, information leakage, firewall and forensics, Web security, and android security.

Information Security

Network flow theory has been used across a number of disciplines, including theoretical computer science, operations research, and discrete math, to model not only problems in the transportation of goods and information, but also a wide range of applications from image segmentation problems in computer vision to deciding when a baseball team has been eliminated from contention. This graduate text and reference presents a succinct, unified view of a wide variety of efficient combinatorial algorithms for network flow problems, including many results not found in other books. It covers maximum flows, minimum-cost flows, generalized flows, multicommodity flows, and global minimum cuts and also presents recent work on computing electrical flows along with recent applications of these flows to classical problems in network flow theory.

Network Flow Algorithms

A modern mathematical approach to the design of communication networks for graduate students, blending control, optimization, and stochastic network theories alongside a broad range of performance analysis tools. Practical applications are illustrated by making connections to network algorithms and protocols. End-of-chapter problems covering a range of difficulties support student learning.

Communication Networks

The two-volume set LNCS 8269 and 8270 constitutes the refereed proceedings of the 19th International Conference on the Theory and Application of Cryptology and Information, Asiacrypt 2013, held in Bengaluru, India, in December 2013. The 54 revised full papers presented were carefully selected from 269 submissions. They are organized in topical sections named: zero-knowledge, algebraic cryptography, theoretical cryptography, protocols, symmetric key cryptanalysis, symmetric key cryptology: schemes and analysis, side-channel cryptanalysis, message authentication codes, signatures, cryptography based upon physical assumptions, multi-party computation, cryptographic primitives, analysis, cryptanalysis and passwords, leakage-resilient cryptography, two-party computation, hash functions.

Advances in Cryptology -- ASIACRYPT 2013

This book provides an overview of the theoretical underpinnings of modern probabilistic programming and presents applications in e.g., machine learning, security, and approximate computing. Comprehensive survey chapters make the material accessible to graduate students and non-experts. This title is also available as Open Access on Cambridge Core.

Foundations of Probabilistic Programming

This book contains papers presented at the Workshop on the Analysis of Large-scale, High-Dimensional, and Multi-Variate Data Using Topology and Statistics, held in Le Barp, France, June 2013. It features the work of some of the most prominent and recognized leaders in the field who examine challenges as well as detail solutions to the analysis of extreme scale data. The book presents new methods that leverage the mutual strengths of both topological and statistical techniques to support the management, analysis, and visualization of complex data. It covers both theory and application and provides readers with an overview of important key concepts and the latest research trends. Coverage in the book includes multi-variate and/or high-dimensional analysis techniques, feature-based statistical methods, combinatorial algorithms, scalable statistics algorithms, scalar and vector field topology, and multi-scale representations. In addition, the book details algorithms that are broadly applicable and can be used by application scientists to glean insight from a wide range of complex data sets.

Topological and Statistical Methods for Complex Data

Using examples and building intuition, this friendly guide helps readers understand and use probabilistic tools from basic to sophisticated.

The Probability Companion for Engineering and Computer Science

This book constitutes the proceedings of the 24th International Conference on Algorithmic Learning Theory, ALT 2013, held in Singapore in October 2013, and co-located with the 16th International Conference on Discovery Science, DS 2013. The 23 papers presented in this volume were carefully reviewed and selected from 39 submissions. In addition the book contains 3 full papers of invited talks. The papers are organized in topical sections named: online learning, inductive inference and grammatical inference, teaching and learning from queries, bandit theory, statistical learning theory, Bayesian/stochastic learning, and unsupervised/semi-supervised learning.

Algorithmic Learning Theory

This book constitutes the proceedings of the 28th International Symposium on Distributed Computing, DISC 2014, held in Austin, TX, USA, in October 2014. The 35 full papers presented in this volume were carefully reviewed and selected from 148 full paper submissions. In the back matter of the volume a total of 18 brief announcements is presented. The papers are organized in topical sections named: concurrency; biological and chemical networks; agreement problems; robot coordination and scheduling; graph distances and routing; radio networks; shared memory; dynamic and social networks; relativistic systems; transactional memory and concurrent data structures; distributed graph algorithms; and communication.

Distributed Computing

The two-volume proceedings LNCS 9056 + 9057 constitutes the proceedings of the 34th Annual International Conference on the Theory and Applications of Cryptographic Techniques, EUROCRYPT 2015, held in Sofia, Bulgaria, in April 2015. The 57 full papers included in these volumes were carefully reviewed and selected from 194 submissions. The papers are organized in topical sections named: honorable mentions, random number generators, number field sieve, algorithmic cryptanalysis, symmetric cryptanalysis, hash functions, evaluation implementation, masking, fully homomorphic encryption, related-key attacks, fully monomorphic encryption, efficient two-party protocols, symmetric cryptanalysis, lattices, signatures, zero-knowledge proofs, leakage-resilient cryptography, garbled circuits, crypto currencies, secret sharing, outsourcing computations, obfuscation and e-voting, multi-party computations, encryption, resistant protocols, key exchange, quantum cryptography, and discrete logarithms.

Advances in Cryptology – EUROCRYPT 2015

The focus of this monograph is on symmetry breaking problems in the message-passing model of distributed computing. In this model a communication network is represented by a n-vertex graph $G = (V,E)$, whose vertices host autonomous processors. The processors communicate over the edges of G in discrete rounds. The goal is to devise algorithms that use as few rounds as possible. A typical symmetry-breaking problem is the problem of graph coloring. Denote by ? the maximum degree of G. While coloring G with ? + 1 colors is trivial in the centralized setting, the problem becomes much more challenging in the distributed one. One can also compromise on the number of colors, if this allows for more efficient algorithms. Other typical symmetry-breaking problems are the problems of computing a maximal independent set (MIS) and a maximal matching (MM). The study of these problems dates back to the very early days of distributed computing. The founding fathers of distributed computing laid firm foundations for the area of distributed symmetry breaking already in the eighties. In particular, they showed that all these problems can be solved in randomized logarithmic time. Also, Linial showed that an O(?2)-coloring can be solved very efficiently

deterministically. However, fundamental questions were left open for decades. In particular, it is not known if the MIS or the (? + 1)-coloring can be solved in deterministic polylogarithmic time. Moreover, until recently it was not known if in deterministic polylogarithmic time one can color a graph with significantly fewer than ?2 colors. Additionally, it was open (and still open to some extent) if one can have sublogarithmic randomized algorithms for the symmetry breaking problems. Recently, significant progress was achieved in the study of these questions. More efficient deterministic and randomized (? + 1)-coloring algorithms were achieved. Deterministic ?1 + o(1)-coloring algorithms with polylogarithmic running time were devised. Improved (and often sublogarithmic-time) randomized algorithms were devised. Drastically improved lower bounds were given. Wide families of graphs in which these problems are solvable much faster than on general graphs were identified. The objective of our monograph is to cover most of these developments, and as a result to provide a treatise on theoretical foundations of distributed symmetry breaking in the message-passing model. We hope that our monograph will stimulate further progress in this exciting area.

Distributed Graph Coloring

The two-volume set LNCS 6755 and LNCS 6756 constitutes the refereed proceedings of the 38th International Colloquium on Automata, Languages and Programming, ICALP 2011, held in Zürich, Switzerland, in July 2011. The 114 revised full papers (68 papers for track A, 29 for track B, and 17 for track C) presented together with 4 invited talks, 3 best student papers, and 3 best papers were carefully reviewed and selected from a total of 398 submissions. The papers are grouped in three major tracks on algorithms, complexity and games; on logic, semantics, automata, and theory of programming; as well as on foundations of networked computation: models, algorithms and information management.

Automata, Languages and Programming

This two-volume set of LNCS 8572 and LNCS 8573 constitutes the refereed proceedings of the 41st International Colloquium on Automata, Languages and Programming, ICALP 2014, held in Copenhagen, Denmark, in July 2014. The total of 136 revised full papers presented together with 4 invited talks were carefully reviewed and selected from 484 submissions. The papers are organized in three tracks focussing on Algorithms, Complexity, and Games, Logic, Semantics, Automata, and Theory of Programming, Foundations of Networked Computation.

Automata, Languages, and Programming

This book constitutes the refereed proceedings of the First International ICST Conference on Theory and Practice of Algorithms in (Computer) Systems, TAPAS 2011, held in Rome, Italy, in April 2011. The 25 papers presented, including three short papers by invited speakers, were carefully reviewed and selected from 45 submissions. The papers all feature original research in the design, implementation and evaluation of algorithms with special focus on algorithms for combinatorial optimization problems, and to real-world applications, engineering and experimental analysis of algorithms - thus fostering the cooperation among researchers in computer science, networking, discrete mathematics, mathematical programming and operations research.

Theory and Practice of Algorithms in (Computer) Systems

Annotation This book constitutes the refereed proceedings of the 10th International Workshop on Algorithms in Bioinformatics, WABI 2010, held in Liverpool, UK, in September 2010. The 30 revised full papers presented were carefully reviewed and selected from 83 submissions. The papers are organized in topical sections on biomolecular structure: RNA, protein and molecular comparison; comparative genomics; haplotype and genotype analysis; high-throughput data analysis: next generation sequencing and flow cytometry; networks; phylogenetics; and sequences, strings and motifs.

Algorithms in Bioinformatics

The three volume-set LNCS 12105, 12106, and 12107 constitute the thoroughly refereed proceedings of the 39th Annual International Conference on the Theory and Applications of Cryptographic Techniques, EUROCRYPT 2020, which was due to be held in Zagreb, Croatia, in May 2020. The conference was held virtually due to the COVID-19 pandemic. The 81 full papers presented were carefully reviewed and selected from 375 submissions. The papers are organized into the following topical sections: invited talk; best paper awards; obfuscation and functional encryption; symmetric cryptanalysis; randomness extraction; symmetric cryptography I; secret sharing; fault-attack security; succinct proofs; generic models; secure computation I; quantum I; foundations; isogeny-based cryptography; lattice-based cryptography; symmetric cryptography II; secure computation II; asymmetric cryptanalysis; verifiable delay functions; signatures; attribute-based encryption; side-channel security; non-interactive zero-knowledge; public-key encryption; zero-knowledge; quantum II.

Advances in Cryptology – EUROCRYPT 2020

In this work we discuss selected topics on small-depth computation, presenting a few unpublished proofs along the way. The four sections contain: (1) A unified treatment of the challenge of exhibiting explicit functions that have small correlation with low-degree polynomials over $\{0, 1\}$.(2) An unpublished proof that small bounded-depth circuits (AC0) have exponentially small correlation with the parity function. The proof is due to Klivans and Vadhan; it builds upon and simplifies previous ones. (3) Valiant's simulation of log-depth linear-size circuits of fan-in 2 by sub-exponential size circuits of depth 3 and unbounded fan-in. To our knowledge, a proof of this result has never appeared in full. (4) Applebaum, Ishai, and Kushilevitz's cryptography in bounded depth.

On the Power of Small-Depth Computation

This two-volume set of LNCS 7391 and LNCS 7392 constitutes the refereed proceedings of the 39th International Colloquium on Automata, Languages and Programming, ICALP 2012, held in Warwick, UK, in July 2012. The total of 123 revised full papers presented in this volume were carefully reviewed and selected from 432 submissions. They are organized in three tracks focussing on algorithms, complexity and games; logic, semantics, automata and theory of programming; and foundations of networked computation.

Automata, Languages, and Programming

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