Solomon W Golomb Shift Register Sequences

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Solomon W Golomb Shift Register Sequences ***2021-07-13***

ROWAN HINES

One Dimensional Cellular Automata Springer
In cryptography, ciphers is the technical term for encryption and decryption algorithms. They are an important sub-family that features high speed and easy implementation and are an essential part of wireless internet and mobile phones. Unlike block ciphers, stream ciphers work on single bits or single words and need to maintain an internal state to change the cipher at each step. Typically stream ciphers can reach higher speeds than block ciphers but they can be more vulnerable to attack. Here, mathematics comes into play. Number theory, algebra and statistics are the key to a better understanding of stream ciphers and essential for an informed decision on their safety. Since the theory is less developed, stream ciphers are often skipped in books on cryptography. This book fills this gap. It covers the mathematics of stream ciphers and its history, and also discusses many modern examples and their robustness against attacks. Part I covers linear feedback shift registers, non-linear combinations of LFSRs, algebraic attacks and irregular clocked shift registers. Part II studies some special ciphers including the security of mobile phones, RC4 and related ciphers, the eStream project and the blum-blum-shub generator and related ciphers. Stream Ciphers requires basic knowledge of algebra and linear algebra, combinatorics and probability theory and programming. Appendices in Part III help the reader with the more complicated subjects and provides the mathematical background needed. It covers, for example, complexity, number theory, finite fields, statistics, combinatorics. Stream Ciphers concludes with exercises and solutions and is directed towards advanced undergraduate and graduate students in mathematics and computer science.
Rhythms of the Brain Springer Science & Business Media
A Conference on the Theory and Application of Cryptographic Techniques, Held at he University of California, Santa Barbara, through the Co-operation of the Computer Science Department, August 18 - 220, 1985
Topics in Finite Fields Springer
This volume comprises an imaginative collection of pieces created in tribute to Martin Gardner. Perhaps best known for writing Scientific American's "Mathematical Games" column for years, Gardner used his personal exuberance and fascination with puzzles and magic to entice a wide range of readers into a world of mathematical discovery. This tribute
Operations Research (unclassified Title) Springer Science & Business Media
This easy-to-read guide provides a concise introduction to the engineering background of modern communication systems, from mobile phones to data compression and storage. Background mathematics and specific engineering techniques are kept to a minimum so that only a basic knowledge of high-school mathematics is needed to understand the material covered. The authors begin with many practical applications in coding, including the repetition code, the Hamming code and the Huffman code. They then explain the corresponding information theory, from entropy and mutual information to channel capacity and the information transmission theorem. Finally, they provide insights into the connections between coding theory and other fields. Many worked examples are given throughout the book, using practical applications to illustrate theoretical definitions. Exercises are also included, enabling readers to double-check what they have learned and gain glimpses into more advanced topics, making this perfect for anyone who needs a quick introduction to the subject.
Solomon Golomb’s Course on Undergraduate Combinatorics Springer
This book constitutes the refereed proceedings of the 7th IMA Conference on Cryptography and Coding held in Cirencester, UK, in December 1999. The 35 revised full papers presented were carefully reviewed and selected for inclusion in the proceedings. Among the topics covered are error-correcting coding, arithmetic coding for data compression and encryption, image coding, biometric authentication, broadcast channel access, graph and trellis decoding, turbo codes, convolution codes, Reed Solomon codes, elliptic curve cryptography, primality testing, finite-field arithmetic, and cryptographic protocols.
Advances in Cryptology Springer Science & Business Media
Communications and Multimedia Security is an essential reference for both academic and professional researchers in the fields of Communications and Multimedia Security. This state-of-the-art volume presents the proceedings of the Eighth Annual IFIP TC-6 TC-11 Conference on Communications and Multimedia Security, September 2004, in Windermere, UK. The papers presented here represent the very latest developments in security research from leading people in the field. The papers explore a wide variety of subjects including privacy protection and trust negotiation, mobile security, applied cryptography, and security of communication protocols. Of special interest are several papers which addressed security in the Microsoft .Net architecture, and the threats that builders of web service applications need to be aware of. The papers were a result of research sponsored by Microsoft at five European University research centers. This collection will be important not only for multimedia security experts and researchers, but also for all teachers and administrators interested in communications security.
Stream Ciphers Luniver Press
This book provides eloquent support for the idea that spontaneous neuron activity, far from being mere noise, is actually the source of our cognitive abilities. In a sequence of "cycles," György Buzsáki guides the reader from the physics of oscillations through neuronal assembly organization to complex cognitive processing and memory storage. His clear, fluid writing-accessible to any reader with some scientific knowledge-is supplemented by extensive footnotes and references that make it just as gratifying

and instructive a read for the specialist. The coherent view of a single author who has been at the forefront of research in this exciting field, this volume is essential reading for anyone interested in our rapidly evolving understanding of the brain.

Shift Register Sequences MIT Press

This graduate-level text gives a thorough overview of the analysis of Boolean functions, beginning with the most basic definitions and proceeding to advanced topics.

Shift Register Sequences World Scientific

This textbook offers an accessible introduction to combinatorics, infused with Solomon Golomb’s insights and illustrative examples. Core concepts in combinatorics are presented with an engaging narrative that suits undergraduate study at any level. Featuring early coverage of the Principle of Inclusion-Exclusion and a unified treatment of permutations later on, the structure emphasizes the cohesive development of ideas. Combined with the conversational style, this approach is especially well suited to independent study. Falling naturally into three parts, the book begins with a flexible Chapter Zero that can be used to cover essential background topics, or as a standalone problem-solving course. The following three chapters cover core topics in combinatorics, such as combinations, generating functions, and permutations. The final three chapters present additional topics, such as Fibonacci numbers, finite groups, and combinatorial structures. Numerous illuminating examples are included throughout, along with exercises of all levels. Three appendices include additional exercises, examples, and solutions to a selection of problems. Solomon Golomb’s Course on Undergraduate Combinatorics is ideal for introducing mathematics students to combinatorics at any stage in their program. There are no formal prerequisites, but readers will benefit from mathematical curiosity and a willingness to engage in the book’s many entertaining challenges.

Communications and Multimedia Security Springer Science & Business Media

A complete, accessible book on single and multiple output Boolean functions in cryptography and coding, with recent applications and problems.

Shift Register Sequences: Secure And Limited-access Code Generators, Efficiency Code Generators, Prescribed Property Generators, Mathematical Models (Third Revised Edition) Springer Science & Business Media

This book constitutes the thoroughly refereed post-proceedings of the Third International Conference on Sequences and Their Applications, SETA 2004, held in Seoul, Korea in October 2004. The 30 revised full papers presented together with 4 invited survey articles were carefully selected during two rounds of reviewing and improvement from initially 59 submissions. The papers are organized in topical sections on complexity of sequences, perfect sequences, sequence construction, sequences modulo z, sequence generator properties and applications, multi-dimensional sequences, optics and OFDM applications, and polynomials and functions.

Sequences, Subsequences, and Consequences Cambridge University Press

This book provides a comprehensive treatment of methodologies and applications including CDMA telephony, coded radar, and stream cipher generation.

Proceedings of CRYPTO '85 Oxford University Press

Details the most important techniques used to make the storage and transmission of data fast, secure, and reliable. Accessible to both specialists and nonspecialists: Avoids complex mathematics

Introduction to Coding Theory Springer Science & Business Media

This book constitutes the refereed proceedings of the 5th International Conference on Sequences and Their Applications, SETA 2008, held in Lexington, KY, USA in September 2008. The 32 revised full papers presented were carefully reviewed and selected. The papers are organized in topical sections on probabilistic methods and randomness properties of sequences; correlation; combinatorial and algebraic foundations; security aspects of sequences; algorithms; correlation of sequences over rings; nonlinear functions over finite fields.

Code Division Multiple Access Communications Cuvillier Verlag

Code Division Multiple Access (CDMA) has become one of the main candidates for the next generation of mobile land and satellite communication systems. CDMA is based on spread spectrum techniques, which have been used in military applications for over half a century. Only recently, however, has it been recognised that spread spectrum techniques, combined with some additional steps, can provide higher capacity and better flexibility for the mobile cellular radio communications. Code Division Multiple Access Communications comprises a set of contributions from the most distinguished world scientists in the field. These papers review the basic theory and some of the most important problems related to spread spectrum and CDMA. The topics covered centre on the information theory aspects of CDMA; interference suppression and performance analysis. The material presented in this book summarises the main problems in modern CDMA theory and practice and gives a solid starting point for studying this complex and still challenging field. As such Code Division Multiple Access Communications is essential reading for all researchers and designers working in mobile communication systems and provides an excellent text for a course on the subject.

Data Privacy and Security Wolfram Media

This volume contains the proceedings of the 11th International Conference on Finite Fields and their Applications (Fq11), held July 22-26, 2013, in Magdeburg, Germany. Finite Fields are fundamental structures in mathematics. They lead to interesting deep problems in number theory, play a major role in combinatorics and finite geometry, and have a vast amount of applications in computer science. Papers in this volume cover these aspects of finite fields as well as applications in coding theory and cryptography.

Shift Register Sequences Cambridge University Press

An essential resource and monograph for all security researchers and practitioners who want to understand and effectively use 'both' information hiding techniques and encryption to protect digital data and have secure communications. All major topics and techniques are presented in an accessible style and suitable for specialists and nonspecialists.

Third International Conference, Seoul, Korea, October 24-28, 2004, Revised Selected Papers Cambridge University Press

Cryptography lies at the heart of most technologies deployed today for secure communications. At the same time, mathematics lies at the heart of cryptography, as cryptographic constructions are based on algebraic scenarios ruled by group or number theoretical laws. Understanding the involved algebraic structures is, thus, essential to design robust cryptographic schemes. This Special Issue is concerned with the interplay between group theory, symmetry and cryptography. The book highlights four exciting areas of research in which these fields intertwine: post-quantum cryptography, coding theory, computational group theory and

symmetric cryptography. The articles presented demonstrate the relevance of rigorously analyzing the computational hardness of the mathematical problems used as a base for cryptographic constructions. For instance, decoding problems related to algebraic codes and rewriting problems in non-abelian groups are explored with cryptographic applications in mind. New results on the algebraic properties or symmetric cryptographic tools are also presented, moving ahead in the understanding of their security properties. In addition, post-quantum constructions for digital signatures and key exchange are explored in this Special Issue, exemplifying how (and how not) group theory may be used for developing robust cryptographic tools to withstand quantum attacks.

Springer Science & Business Media

This book of thoroughly engaging essays from one of today's most prodigious innovators provides a uniquely personal perspective on the lives and achievements of a selection of intriguing figures from the history of science and technology. Weaving together his immersive interest in people and history with insights gathered from his own experiences, Stephen Wolfram gives an ennobling look at some of the individuals whose ideas and creations have helped shape our world today. Contents includes biographical sketches of: Richard Feynman Kurt Godel Alan Turing John von Neumann George Boole Ada Lovelace Gottfried Leibniz Benoit Mandelbrot Steve Jobs Marvin Minsky Russell Towle Bertrand Russell Alfred Whitehead Richard Crandall Srinivasa Ramanujan Solomon Golomb

Volume 23 MDPI

This dissertation demonstrates the implementation of ultra-wideband (UWB) radar sensors using commercial off-the-shelf electronics. The sensors are based on the correlation of binary pseudo noise sequences (M-sequences), combining low transmit power requirements with excellent noise and interference suppression. A ranging system is introduced that is able to track moving objects with a standard deviation of 1.73mm at 2m range. Subsequently, a system is developed which can synchronize itself to a reference sequence with 1.96ps RMS jitter. This synchronization system uses an analog correlating control loop (delay lock loop) to achieve tracking of the reference to 0.38% of one chip. The final application shown is a ground penetrating radar (GPR). The system is comprised of three elements: an FPGA, an output driver for the transmitter and a commercial analog-to-digital converter. Comparative measurements on buried pipes and cables prove that this system has achieved detection capability comparable to commercially available pulsed GPRs.