Proposal for A Special Issue of the IEEE Transaction on Information Theory in Memory of Solomon W. Golomb

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We are honored to present a proposal for organizing a special issue of the IEEE Transaction on Information Theory in memory of Solomon W. Golomb.

Solomon Golomb, Sol, called by many people, passed away peacefully on May 1, 2016. Just ten days earlier he was awarded the prestigious Franklin Medal 2016 in Electrical Engineering for his revolutionary work on shift register sequences and their applications to space communications, satellite communications and cellular communications. Golomb pioneered the concept of the shift register sequences when he leaded various significant projects in Jet Propulsion Laboratory (JPL) including the project on “early orbit determination” of the first satellite Explorer I, launched by US, and Venus Radar detection project during the end of 50’s and beginning of 60’s. His book, Shift Register Sequences, probably the most influential publication ever since it is published, which has long been a standard reading requirement for new recruits in many organizations, including the National Security Agency and a variety of companies that design secure communication systems.

Golomb has landmarked a wide variety of topics in addition to shift register sequences, such as Boolean functions, cryptography, Golomb code, Golomb rulers for astronomy, Exp-Golomb code and Golomb-Rice code, and Costas arrays. Those work has inspired many researchers in engineering, computer science, and mathematics for years. He is a regular columnist, writing Golomb’s Puzzle Column in the IEEE Information Society Newsletter, which entertained for years. His invention of polyominoes leads to the creation of popular computer game Tetris.

Golomb received many most distinguished and notable awards for his great achievements in engineering. He was elected to National Academy of Sciences in 2003, to National Academy of Engineering in 1976, the Fellow of the IEEE since 1982, Shannon Award in 1985, the IEEE Richard W. Hamming Medal in 2000, and Fellow of the American Mathematical Society (2012). He was a giant in coding and information theory for over five decades, specifically for his ability to apply advanced mathematics to problems in digital communications, coding and cryptography. He won the National Medal of Science in 2013 from US President Obama prior he received the Franklin Award this year.

As a summary of the rationale for such a special issue, we quote from the IEEE News
Letter June 2016, the column from the Editor: Beyond being a pillar of our society and an amazing scholar, he has shaped the content of our newsletter and has been a long time and consistent contributor enlightening us all, young and old, with his beautiful puzzles. As the Dean of the USC Viterbi School of Engineering Yannis C. Yortsos wrote, “With unparalleled scholarly contributions and distinction to the field of engineering and mathematics, Sol’s impact has been extraordinary, transformative and impossible to measure. His academic and scholarly work on the theory of communications built the pillars upon which our modern technological life rests.”

Title of the special issue: Shift Register Sequences in Memory of Solomon W. Golomb.

Scope of the special issue: It encompasses all aspects of nonlinear and linear feedback shift register sequences and their applications in communications, cryptography, coding, and combinatorics including periodic or aperiodic correlation, linear complexity, sequences for compression and randomness extraction, Boolean and vectorial Boolean functions, Costas arrays, sequences for spread spectrum, OFDM and MIMO wireless communication, sequences for lightweight stream ciphers and pseudorandom generation, and sequences related finite fields, difference sets, permutations and exponential sums.

Schedule and contributions: Original research papers are sought in those areas, and a few (e.g., 3 or 4) invited expository and survey papers related to Solomon Golomb’s work are expected to include in this special issue. The expected publication date will be in January 2018. The detailed schedule is included in the call-for-papers.

Guest Editors:

Guang Gong, University of Waterloo, Canada
Tor Helleseth, University of Bergen, Norway
Vijay Kumar, Indian Institute of Science, India

Invited contributors for survey types:

Elwyn Berlekamp
Alfred Hales
Andrew Viterbi
Call-for-Papers

IEEE Transactions on Information Theory
Special Issue on
Shift Register Sequences in Memory of Solomon W. Golomb

A special issue of the IEEE Transactions on Information Theory is devoted in memory of Solomon W. Golomb for his revolutionary work on shift register sequences and their applications to communications and cryptography.

The scope of the special issue encompasses all aspects of nonlinear and linear feedback shift register sequences and their applications in communications, cryptography, coding, and combinatorics. Original research papers are sought in those areas, and a few invited expository and survey papers related to Solomon Golomb’s work are intended. The expected publication date will be by the beginning of 2018.

The topics of interest include but are not limited to:
- Nonlinear and linear feedback shift register sequences
- Periodic or aperiodic correlation and linear complexity
- Error correcting code
- Sequences for compression, and randomness extraction
- Boolean and vectorial Boolean functions for sequences
- Costas arrays
- Sequences for spread spectrum, OFDM and MIMO wireless communication,
- Sequences for lightweight stream ciphers and pseudorandom generation
- Sequences related finite fields, difference sets, and exponential sums.

Important Dates:
Manuscript submission: May 31, 2017
Completion of first round of reviews: September 30, 2017
Revised manuscript submission: October 31, 2017
Notification of final decision: November 30, 2017
Final manuscript submission: December 31, 2017
Prospective authors should submit their papers through https://mc.manuscriptcentral.com/t-it and follows the regular guidelines of the IEEE Transactions on Information Theory.

Guest Editors
Guang Gong, University of Waterloo, Canada
Tor Helleseth, University of Bergen, Norway
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