2017 Eighth International Workshop on Signal Design and Its Applications in Communications (IWSDA 2017)

Sapporo, Japan
24-28 September 2017
# Table of Contents

**Preface**

**Conference Organization**

**Technical Program**

**Invited Talks**

1. Aperiodic sequence design and McEliece’s open problem  
   Prof. Wai Ho Mow (Hong Kong University of Science and Technology, China)

2. StarBED The Emulator - From ICT into IoT -  
   Prof. Yoichi Shinoda (Japan Advanced Institute of Science and Technology, Japan)

3. From Signals, through Words, to Safe Behavior - Value Alignment by Human Experience Analysis  
   Prof. Rafal Rzepka (Hokkaido University, Japan)

4. Novel FFT over Binary Finite Fields and Its Application to Reed-Solomon Erasure Codes  
   Prof. Yunghsiang S. Han (Dongguan University of Technology, China)

**Session 1 : Complementary sequences and Z-complementary sequences**

1-1. **Constructions of Gaussian Integer Z-Periodic Complementary Sequence Sets**  
     Xiaoyu Chen, Yubo Li, Xiuping Peng, Hongbin Lin (Yanshan University, China)

1-2. **A New Method to Construct Golay Complementary set and Near-Complementary set by Paraunitary Matrices**  
     Dongxu Ma, Zilong Wang (Xidian University, China), Guang Gong (University of Waterloo, Canada), Hui Li (Xidian University, China)

1-3. **New Optimal Binary Z-Complementary Pairs of Odd Lengths**  
     Avik R. Adhikary, Sudhan Majhi (Indian Institute of Technology, India), Zilong Liu, Yong Liang Guan (Nanyang Technological University, Singapore)

1-4. **Doppler Resilient Z-complementary Waveforms From ESP Sequences**  
     Jiahuan Wang, Pingzhi Fan, Yang Yang (Southwest Jiaotong University, China), Zilong Liu, Yong Liang Guan (Nanyang Technological University, China)

1-5. **A Method to Construct Complementary Sets of Non-Power-of-Two Length by Concatenation**  
     Zilong Wang, Erzhong Xue, Jinjin Chai (Xidian University, China)

**Session 2 : Communication theory**

2-1. **Raptor Decoding for High Overloaded Wireless Super-Dense Networks**  
     I Nyoman Apraz Ramatryana, Khoirul Anwar (Telkom University, Indonesia)

2-2. **An Opportunistic-Bit Transmission Scheme With Enhanced Spectral Efficiency**  
     Yingyang Chen, Mingxi Yin, Bingli Jiao (Peking University, China)

2-3. **Capacity Results on the Multiple-Access Wiretap Channel with Noiseless Feedback**  
     Bin Dai (Southwest JiaoTong University, China)

2-4. **A Theoretical Analysis of Visible-Light Variable N-parallel Code-Shift-Keying in LOS Indoor Environments**  
     Keisuke Osawa, Hiromasa Habuchi, Yusuke Kozawa (Ibaraki University, Japan)
Session 3: Image and acoustic signal processing

3-1. Reinhard’s Global Operator Based Inverse Tone Mapping with One Parameter
Yuma Kinoshita, Sayaka Shiota, Hitoshi Kiya (Tokyo Metropolitan University, Japan)

3-2. Speeding up Image Identification with Visually Protected Features for JPEG Image
Kenta Iida, Hitoshi Kiya (Tokyo Metropolitan University, Japan)

3-3. Lattice Adaptive Filtering-Based Method for Acoustic Feedback Cancellation in Hearing Aids With Robustness Against Sudden Changes in the Feedback Path
Muhammad Tahir Akhtar (Nazarbayev University, Kazakhstan) Akinori Nishihara (Tokyo Institute of Technology, Japan)

3-4. On the Security of Block Scrambling-Based Image Encryption Including JPEG Distorsion against Jigsaw Puzzle Solver Attacks
Tatsuya Chuman, Hitoshi Kiya (Tokyo Metropolitan University, Japan)

Session 4: Sequence design and analysis of sequences (1)

4-1. Unimodular Sequences with Good Aperiodic Autocorrelation
Anatolii Leukhin, Vladimir Bezrodnyi, Nikolay Parsaev (Mari State University, Russia)

4-2. Linear Complexity of Generalized NTU Sequences
Kazuyoshi Tsuchiya (Koden Electronics Co., Ltd., Japan), Chiaki Ogawa, Yasuyuki Nogami (Okayama University, Japan), Satoshi Uehara (the University of Kitakyushu, Japan)

4-3. A Kind of Disjoint Cyclic Perfect Mendelsohn Difference Family and Its Applications in Strictly Optimal FHSs
Shanding Xu, Xiwang Cao (Nanjing University of Aeronautics and Astronautics, China), Chunming Tang (Guangzhou University, China)

4-4. Linear Complexity of Pseudo Random Binary Sequence Generated by Trace Function and Legendre Symbol Over Proper Sub Extension Field
Ali Md Arshad (Okayama University, Japan), Takeru Miyazaki (The University of Kitakyushu, Japan), Shoji Heguri, Yasuyuki Nogami (Okayama University, Japan), Satoshi Uehara (The University of Kitakyushu, Japan), Robert Morelos-Zaragoza (San Jose State University, USA)

Session 5: Communication system (1)

5-1. The Effect of Carrier Frequency Offsets on an IDMA-UFMC System
Jui-Hsien Hsieh, Ming-Fu Tang, Mao-Chao Lin, Borching Su (National Taiwan University, Taiwan)

5-2. Coded Random Access with Simple Header Detection for Finite Length Wireless IoT Networks
Khoirul Anwar, Juansyah, Budi Syihabuddin, Nachwan Mufti Adriansyah (Telkom University, Indonesia)

5-3. Impact of Framed-DOOK Optical Wireless System using Error Correcting Codes
Ran Sun, Hiromasa Habuchi, Yusuke Kozawa (Ibaraki University, Japan)

5-4. A class of two-weight and three-weight codes from a certain non-quadratic function
Guangkui Xu (Huainan Normal University, China), Xiwang Cao (Nanjing University of Aeronautics and Astronautics, China), Wei Du (Huainan Normal University, China), Gaojun Luo (Nanjing University of Aeronautics and Astronautics, China)

Session 6: Perfect sequences and ZCZ sequences

6-1. Constructions of Asymmetric Binary ZCZ Sequence Sets
Tao Liu, Yubo Li, Chengqian Xu, Xiaoyu Chen (Yanshan University, China)

6-2. New perfect sequences from Helleseth-Gong sequences
Yang Yang, Yong Wang (Southwest Jiaotong University, China)

6-3. A construction of optimal generators of odd lengths for perfect sequence families
Min Kyu Song, Gangsan Kim, Hong-Yeop Song (Yonsei University, Korea)

6-4. Construction of ZCZ Huffman Sequences for Underground Multiplexing Sonar
Yoshihiro Tanada (Kyoto University, Japan), Kiminori Sato (Kagoshima University, Japan), Masato Iguchi (Kyoto University, Japan), Baiko Sai (Daichi Institute of Technology, Japan)
Session 7: Other applications of sequences

7-1. Signals for Synthetic Aperture Radar
Vladimir Bezrodnyi, Anatolii Leukhin (Mari State University, Russia)

7-2. A Study on a Digital Watermarking Technique for Music Data Using Distortion Effect
Yuto Matsunaga (Hokkaido University, Japan), Tetsuya Kojima (National Institute of Technology, Japan), Naofumi Aoki, Yoshinori Dobashi, Tsuyoshi Yamamoto (Hokkaido University, Japan)

7-3. On the Host Signal Approximation for Image Data Hiding Scheme Based on Complete Complementary Codes
Tetsuya Kojima, Kakeru Kato (National Institute of Technology, Tokyo College, Japan)

7-4. Novel Authentication Scheme with Pseudorandom Sequences in the Frequency Domain of Images
Patrick Vicky, Udaya Parampalli (University of Melbourne, Australia)

Session 8: Communication system (2)

8-1. Three Hop AF Relay Transmissions for OFDM Applying Real and Imaginary TFI Pilot Signals
Yuta Ida, Takahiro Matsumoto, Shinya Matsufuji (Yamaguchi University, Japan)

Takashi Tokunaga, Hiromasa Habuchi, Yusuke Kozawa (Ibaraki University, Japan)

8-3. A Study on PAPR Reduction in OFDM Using Complex Hadamard Matrices
Zeming Dong, Shinya Matsufuji, Yuta Ida, Takahiro Matsumoto (Yamaguchi University, Japan)

8-4. Influence of ISI on Synchronous OCDMA System Using an Optical ZCZ Sequence Set on a Diffuse Channel
Takahiro Matsumoto, Masanori Kurashita, Yasuaki Ohira (Yamaguchi University, Japan), Hideyuki Torii (Kanagawa Institute of Technology, Japan), Yuta Ida, Shinya Matsufuji (Yamaguchi University, Japan)

Session 9: Sequence design and analysis of sequences (2)

9-1. Semi-Bent Functions with Perfect Three-Level Additive Autocorrelation
Deng Tang, Yang Yang (Southwest Jiaotong University, China), Shaojing Fu (National University of Defense Technology, China)

9-2. A lower bound on the 2-adic complexity of Whiteman’s generalized cyclotomic sequences of order 4 with length \( puq \)
Yuhua Sun (China University of Petroleum, China), Qiang Wang (Carleton University, Canada), Qiuyan Wang (Tianjin Polytechnic University, China), Tongjiang Yan (China University of Petroleum, China),

9-3. Sequence Design for Optimized Ambiguity Function and PAPR under Arbitrary Spectrum Hole Constraint
Tianjun Liu, Pingzhi Fan, Jiandong Li, Yang Yang, (Southwest Jiaotong University, China), Zilong Liu, Yong Liang Guan (Nanyang Technological University, Singapore)

9-4. On the Consecutive Sets of Defining Sequence for Lower Bounds on Cyclic Codes
Junru Zheng (Kyushu Women’s University, Japan), Takayasu Kaida (Kindai University, Japan)

9-5. Some Properties of \( Z_4 \) Sequences Obtained by Using the Gray Code Mapping from Two Binary M-Sequences
Masahiro Goto, Satoshi Uehara (The University of Kitakyushu, Japan), Yasuyuki Nogami (Okayama University, Japan)

Session 10: Coding Theory

10-1. A class of linear codes with two and three weights
Xiaodan Li, Xiaoni Du, Hongxia Lv, Liping Zhao (Northwest Normal University, China)

10-2. A Lower Bound on the Second-Order Nonlinearity of the Class of Maiorana-McFarland Bent Functions
Qi Gao, Deng Tang (Southwest Jiaotong University, China)

10-3. Interpretation of Polar Codes with Plotkin Construction Based on Gaussian Approximation
Jinsoo Park, Inseon Kim, Hong-Yeop Song (Yonsei University, Korea)

Author Index