

IEEE Information Theory Society Newsletter



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EDITOR: Changho Suh

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President's Column

Wei Yu

The information theory society has just held its annual symposium virtually for the second time, in Melbourne, Australia over nine days in July, which makes it the longest ISIT ever. I am happy to report that it was a resounding success, despite the circumstance that only allowed us to meet online. I wish to credit the general chairs, Emanuele Viterbo and Parastoo Sadeghi and the technical program committee chairs for running a fantastic event and for coming up with an innovative format of micro-sessions that truly promoted real-time virtual interactions. I attended many of these technical sessions, as well as the plenary talks and the tutorials, and thoroughly enjoyed meeting authors and attendees on the virtual platform. The challenge posed by the different time zones of the participants from all over the world speaks to our society's global outreach. This ISIT is our sixth in Asia Pacific—a region which is very important to the Information Theory Society and where more than 30% of our members live and work. The first ISIT held in Asia Pacific was in Kobe, Japan in 1988, followed by Yokohama in 2003, Adelaide, Australia in 2005, Seoul, Korea in 2009, then Hong Kong in 2015. In two years, the ISIT will return to Taipei in 2023.

The highlights of the ISIT are undoubtedly the 2021 Shannon Lecture by Alon Orlitsky, and the announcement of the 2022 Shannon Lecturer, Raymond W.-H. Yeung. The Claude E. Shannon Award, instituted to honor consistent and profound contributions to the field of information theory, is the highest honor of our society. Throughout its history since 1973, starting from Claude Shannon himself, each of the past 43 Shannon Award recipients have shown us what the concept of *information* truly means—how information can be transmitted, received, coded, compressed, and stored; how information propagates through a network; how information may be shared or kept secret, and how information theory interacts with other disciplines, from physics, to mathematics and statistics, to computer science, to signal processing, and to machine learning.



Alon Orlitsky is known for his contributions to the fields of communication complexity, source coding, and in probability estimation. From his early work on the value of interactive communications and on universal compression with unknown and large alphabets, to his more recent work on population estimation and the estimation of distributions and distribution functionals, Alon's work has shown many aspects of the fundamental limits of information acquisition and understanding. The video of his Shannon Lecture is still available on the virtual platform in case you missed the live event, and will be archived for posterity on itsoc.org.

I am excited to report that Raymond Yeung is the recipient of the 2022 Shannon Award. Raymond has been a driving force and a primary inventor of network coding, which has given us a fresh perspective on the nature of network information flow. Raymond's work has shown how mixing information can help maximally utilize the bottleneck in a network, and has influenced disciplines beyond our own community—to computer science and to networking. Raymond has also made seminal contributions to the mathematical underpinning of information theory. Together with Zhen Zhang, he discovered that there are information inequalities beyond the Shannon type. We all look forward to Raymond's Shannon Lecture at the next ISIT.

Our society's flagship event, the IEEE Symposium on Information Theory, has always been an occasion to celebrate the achievements and the contributions of our members. I wish to particularly highlight the 2021 Information Theory Society Paper Award, announced at ISIT, which is given to a group of six authors for the paper that establishes in the positive the long-standing conjecture that the Reed-Muller codes achieve the capacity of erasure channels.

(continued on page 8)

From the Editor

Changho Suh



I hope you have enjoyed the summer in particular with ISIT, as well as with some of the IT Schools, all of which were held viturally due to the continuing pandemic. We start this fall issue with the president's column sharing ISIT's highlights and interesting stroies behind the prestigious awards given and/or announced at the event. We then feature IEEE society-level awards given to members of our society. Next we have an article on the activities of the IEEE Information Theory Society Guangzhou Chapter who received the 2021 Chapter of the Year award. We also have reports from the 2020 IEEE European School of Information Theory and the 2021 IEEE North American School of Information Theory. As usual, we continue with the minutes from the Board of Governors meeting that was held viturally this past June. With sadness, we conclude this issue with a tribute to Michele Elia who passed away unexpectedly this April.

As a reminder, announcements, news, and events intended for both the printed newsletter and the website, such as award announcements, calls for nominations, and upcoming conferences, can be submitted at the IT Society website <http://www.itsoc.org>. Articles and columns can be e-mailed to me at chsuh@kaist.ac.kr with a subject line that includes the phrase "IT newsletter."

The next few deadlines are:

October 31, 2021 for the issue of December 2021.

January 31, 2022 for the issue of March 2022.

April 30, 2022 for the issue of June 2022.

Please submit plain text, LaTeX, or Word source files; do not worry about fonts or layout as this will be taken care of by IEEE layout specialists. Electronic photos and graphics should be in high resolution and sent as separate files.

Changho Suh

IEEE Information Theory Society Newsletter

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Awards

Congratulations to the members of our community that have recently received recognition for their exceptional contributions.

Raymond W. Yeung: 2022 Claude E. Shannon Award

The Claude E. Shannon Award is the highest honor from the IEEE Information Theory Society. The award has been instituted to honor consistent and profound contributions to the field of information theory.

Gerhard Kramer: 2021 Aaron D. Wyner Distinguished Service Award

The Aaron D. Wyner Distinguished Service Award of the IT Society has been instituted to honor an individual who has shown outstanding leadership in, and provided long-standing, exceptional service to, the Information Theory community.

Changho Suh: 2021 James L. Massey Research & Teaching Award for Young Scholars

The James L. Massey Research & Teaching Award for Young Scholars recognizes outstanding achievement in research and teaching by young scholars in the Information Theory community.

Anuran Makur: 2021 Thomas M. Cover Dissertation Award

The IEEE Information Theory Society Thomas M. Cover Dissertation Award is awarded annually to the author of an outstanding doctoral dissertation contributing to the mathematical foundations of any of the information sciences within the purview of the Society.

- Anuran Makur, "Information Contraction and Decomposition," *Ph.D. Thesis, Massachusetts Institute of Technology*, June 2019.

2021 Information Theory Society Paper Award

The purpose of the Information Theory Paper Award is to recognize exceptional publications in the field and to stimulate interest in and encourage contributions to fields of interest of the Society.

- Shrinivas Kudekar, Santhosh Kumar, Marco Mondelli, Henry D. Pfister, Eren Şaşıoğlu, and Rüdiger L. Urbanke, "Reed–Muller Codes Achieve Capacity on Erasure Channels," *IEEE Transactions on Information Theory*, vol. 63, no. 7, pp. 4298–4316, July 2017.

2021 Communications Society & Information Theory Society Joint Paper Award

The purpose of the Communications Society & Information Theory Paper Award is to recognize the authors of outstanding papers appearing in any publication of the IEEE Communications Society or the IEEE Information Theory Society in the previous three calendar years.

- Sung-En Chiu, Nancy Ronquillo, and Tara Javidi, "Active Learning and CSI Acquisition for mmWave Initial Alignment," *IEEE Journal on Selected Areas in Communications*, vol. 37, no. 11, pp. 2474–2489, November 2019.

2021 Jack Keil Wolf ISIT Student Paper Award

The IEEE Jack Keil Wolf ISIT Student Paper Award is given to up to three outstanding papers for which a student is the principal author and presenter. The award is based on the paper's technical contribution as well as the quality of its presentation. The prize was awarded to two papers this year:

- Lekshmi Ramesh, Indian Institute of Science, "Multiple Support Recovery Using Very Few Measurements Per Sample," co-authored with Chandra R. Murthy and Himanshu Tyagi.
- Hanwen Yao, University of California at San Diego, "A Deterministic Algorithm for Computing the Weight Distribution of Polar Codes," co-authored with Arman Fazeli and Alexander Vardy.

2021 Chapter of the Year Award

The Chapter of the Year Award recognizes a chapter that has provided their membership with the best overall set of programs and activities. The 2021 winner is

- Guangzhou Section Chapter

Bin Yu: An Honorary Doctorate from the University of Lausanne, Faculty of Business and Economics

Bin Yu has been awarded an Honorary Doctorate from the University of Lausanne, Faculty of Business and Economics, in Switzerland. She was honored as "one of the most influential researchers of her time in Statistics and Data Science, for the excellence and impact of her work, and for her major contributions to the development and advancement of machine learning."

IEEE Information Theory Society Guangzhou Chapter

Li Chen

Professor of Sun Yat-sen University, Chair of the Chapter

On June 11, IEEE Information Theory Society announced that the Guangzhou Chapter is the recipient of the 2021 Chapter-of-the-Year Award. Guangzhou Chapter was founded in November 2019, transplanting the success of the 2018 IEEE Information Theory Workshop (ITW) that took place at Sun Yat-sen University (SYSU). The Chapter was established with a mission of *Promote Exchanges and Serve the Community*, hoping to proliferate information theory research and knowledge transfer in the Guangdong-Hong Kong-Macau Greater Bay Area, and South China at large. The Greater Bay Area is the national information technology innovation hub, with industrial conglomerates such as Huawei, Tencent and ZTE. Guangdong is also home to several key national higher education institutes, such as Sun Yat-sen University, South China University of Technology, Harbin Institute of Technology (Shenzhen), the Chinese University of Hong Kong (Shenzhen), the Tsinghua Shenzhen International Graduate School, the Tsinghua-Berkeley Shenzhen Institute and many others. It is envisioned that the Chapter will play an important role in higher education and technology innovation. Since its founding, besides promoting the IEEE membership, the Chapter has organized seasonal research workshops and established its Newsletters. The Chapter has been delighted by this recognition from the Society, but also more encouraged to continue its endeavor.

The 2018 ITW took place during November 25–29 in the historic Guangzhou south campus of SYSU. It was chaired by Pingzhi Fan and Li Chen. The workshop had welcomed 187 participants from 23 countries. Daily plenary talks were given by Erdal Arkan (on *A Survey of Polarization Techniques for Multi-Terminal Source and Channel Coding*), David Tse (on *Operating Blockchains Near Physical Limits*), Raymond Yeung (on *Information Diagrams for Markov Random Fields*) and Peiying Zhu (on *Polar Codes for 5G New Radio*) successively over its four-day technical program with a proceeding that contains 126 papers. The workshop also hosted two tutorials for the first time in ITWs. At the fringe of the ITW, the SYSU Coding and Information Theory Workshop took place on November 30 at the University's Guangzhou higher education megacentre campus, 20km east of the ITW venue. This one-day event has welcomed more than 70 participants with free registrations. It is substantiated by seven invited talks that were given by Richard Blahut (on *Channel Capacity from Waves to Particles*), Aditya Ramamoorthy (on *Reduced Subpacketization from Linear Block Codes*), Aylin Yener (on *Recent Advances in Cache-Aided Wireless Networks*), Fang-Wei Fu (on *Stopping Set Distributions of Linear Codes*), Meir Feder (on *Information and Uncertainty in Learning*), Pascal Vontobel (on *Graphical Models for Quantum Information Processing*) and Daniela Tuninetti (on *Reliability, Latency, Rate Tradeoffs for Downlink Wireless Systems*). During the lunch break, participants also visited the Tianhe-II supercomputer. This workshop provided an extra opportunity for the SYSU graduate students to interact with the ITW participants.

Coinciding with its founding, the Chapter organized its first event, the SYSU Workshop on Polar Coding Theory and Applications, at the University's Guangzhou south campus on November 29, 2019. The founding ceremony was marked by the speeches of Derong Liu, chair of IEEE Guangzhou Section, Stark Drapper, member of



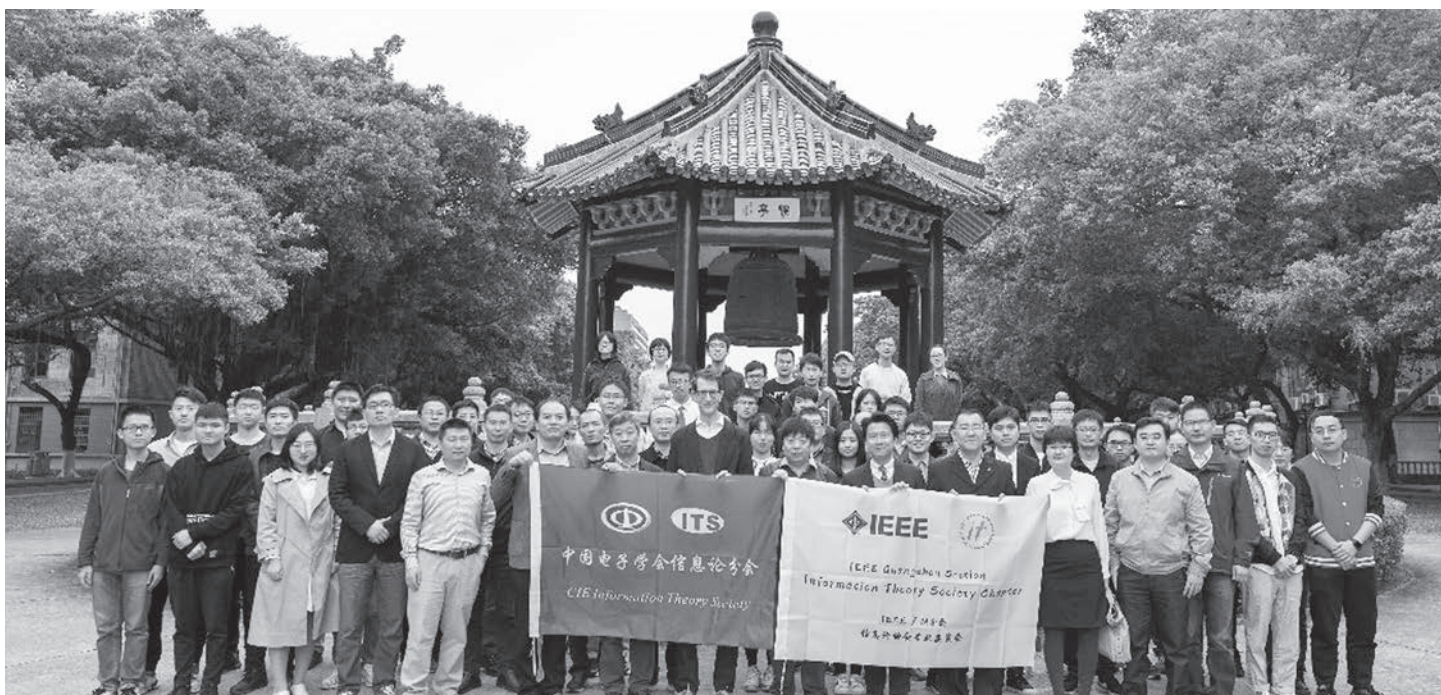
ITW Guangzhou, Nov. 2018.



SYSU Coding and Information Theory Workshop, Nov. 2018.

the Society Board of Governors, and Baoming Bai, chair of the Chinese Information Theory Society. Representatives of Beijing Chapter, Chengdu Chapter and Hong Kong Chapter also came to celebrate this new Chapter. Technical program of the workshop consisted of seven invited talks given by Baoming Bai (on *Discussions on Some Problems in Polar Coding Systems*), Kai Niu (on *Design and Decoding of High Performance Polar Codes*), Liping Li (on *Survey on Polar Code Construction*), Xiao Ma (on *Design of Rate-Loss-Free Concatenated Polar Codes*), Huazi Zhang (on *AI Coding and Future Challenges of Polar Coding*), Zhiliang Huang (on *Successive Cancellation Decoding of Binary Polar Codes with Medium Kernels*) and Ting-Yi Wu (on *Joint Source-Channel Polar Codes*), respectively. The workshop had welcomed more than 60 participants.

Despite the covid-19 pandemic challenge, the Chapter had organized two research workshops in 2020. On September 26, the Chapter hosted the SYSU Workshop on Network Information Theory and Coding. It was an onsite event that the Chapter experimented while the country was stepping out of lockdown. The workshop went well with more than 50 academic and industrial participants. There were seven invited talks, which were given by Raymond Yeung (on *Recent Results on Symmetric Multilevel Diversity Coding*), Xiaohu Tang (on *Placement Delivery Array for Distributed System*), Shutao Xia (on *Improved Bounds and*



Founding of Guangzhou Chapter, Nov. 2019.

Singleton-Optimal Constructions of Locally Repairable Codes), Hao Chen (on Several Constructions of Subspace Codes), Minquan Cheng (on Coded Caching Schemes from Placement Delivery Array), Min Ye (on New Constructions of Cooperative MSR Codes: Reducing Node Size to $\exp(O(n))$) and Congdian Li (on Multi-Source Multicast Network Coding Rate Region). Due to the travel restriction between Hong Kong and the mainland, Raymond gave his talk online, while others gave onsite talks. Our participants were excited by seeing each other again.

On December 2–3, the Chapter hosted another research workshop, the SYSU International Workshop on Mathematics and Coding. Information coding was founded on mathematics, which can be demonstrated by the development of classic codes, modern codes and the more recent network codes. This workshop aimed to revisit the mathematics that we have used for designing and practicing codes, so that we can better look forward. It was a hybrid event with more than 50 oversea online participants and more than 80 domestic onsite participants. The two-day program consisted of 15 invited talks spanning 4 sessions, which were chaired by Li Chen, Pingzhi Fan, Baoming Bai and Bazhong Shen, respectively. The invited talks were given by Alexander Barg (on *Stolarsky's Invariance Principle for the Hamming Space and Energy Maximization*), Jun Chen (on *The Duality Between Slepian-Wolf Coding and Channel Coding*), Li Chen (on *The Gröbner Bases in Decoding of Reed-Solomon Codes*), Paul Siegel (on *Coding for Efficient DNA Synthesis*), Erdal Arıkan (on *Polarization Adjusted Convolutional (PAC) Codes*), Martin Bossert (on *Information Set Decoding of BCH Codes over Binary Symmetric Channel*), Bob Li (on *Commutative Algebra in Network Coding*), Frank Kschischang (on *Zipper Codes*), Dmitry Trukhachev (on *Braided Block Codes, Structural Relation to Zipper Codes and Fiber-Optical Communications Aspects*), Hamid Ebrahimzad (on *Concatenated Polar-Zipper Codes in Optical Communication*), Kai Niu (on *Polar Spectrum: A Bridge between Polar Codes and Algebraic Codes*), Peter Trifonov (on *Trellises, BCH Codes, Finite Fields and Successive*



SYSU Workshop on Polar Coding Theory and Applications, Nov. 2019.



SYSU Workshop on Network Information Theory and Coding, Sept. 2020.



SYSU International Workshop on Mathematics and Coding, Dec. 2020.

Cancellation Decoding), Pingyi Fan (on *MIN-GAN: Interpretable Generative Adversarial Networks with Exponential Function*), Fang-Wei Fu (on *Optimal Cyclic (r, δ) Locally Repairable Codes with Unbounded Length*) and Raymond Leung (on *Coding: Not Only Mathematics*). Broad mathematical arts in coding were covered by the above talks. Besides strengthening friendships and forging collaborations, the Chapter also hoped that the workshop could inspire more young talents.

In 2020, the Chapter also launched its seasonal Newsletters, providing a literature platform for the community. It is a bilingual (Chinese/English) journal including sections such as Recent Results, Research Activities, Opportunities, New Talents and etc. So far, the Chapter has produced four issues. Publishing rigorous research articles requires a long period to accommodate the process of review and revision. It is hoped that the Newsletters can play a

complementary role for our members to announce their results or even conjecture more timely. It is also a platform for seeking collaborations and promoting young members.

In 2021, the Chapter will organize two seasonal workshops. They include the Greater Bay Area International Workshop on Information Theory and Artificial Intelligence, which will take place on September 25 at Tsinghua Shenzhen International Graduate School, and the International Workshop on Algebraic Coding Theory and Techniques, with its date and location to be determined. The Chapter website will also be launched this year. Looking ahead, the Chapter is organizing the 2022 East Asian School of Information Theory, which will take place in August in Shenzhen. Chapter members from SYSU, the Chinese University of Hong Kong (Shenzhen) and the Tsinghua-Berkeley Shenzhen Institute are organizing this School.

Report on the 2020 IEEE European School of Information Theory

Stephan ten Brink and Christian Senger (co-organizers)

The 2020 IEEE European School of Information Theory was held as a virtual school based in Stuttgart, Germany, from November 22 to November 27, 2020. The school was originally planned as a “traditional” school to be held in May 2020 but, due to the COVID-19 pandemic, it had to be postponed and (in consultation with the ITSoc schools committee) turned into a virtual school.

The school consisted of six exciting tutorial lectures, namely:

- David Sutter (Quantum Information Theory)

- Sennur Ulukus (Private Information Retrieval)
- Jakob Hoydis, Sebastian Cammerer, Sebastian Dörner and Tim Uhlemann (Deep Learning Applications in Communications)
- Alexios Balatsoukas-Stimming (Efficient Decoding of Polar Codes: Algorithms and Implementations)
- Swanand Kadhe (Making Blockchains Scalable and Efficient: The Power of Codes)

- Ayfer Özgür (2020 Goldsmith Lecturer, Communications-Efficient and Privacy-Preserving Distributed Learning)

Besides the full lectures, there were also two interesting short lectures presented by:

- Reinhard Heckel (Deep Learning for Inverse Problems)
- Laurent Schmalen (Spatially Coupled LDPC Codes - Theory and Applications)

All lectures were presented in the form of high-quality pre-recorded videos that were distributed over a Video Showcase on the IT-Soc Vimeo account. The school participants had the opportunity to discuss with the lecturers in moderated live Q&A sessions on Zoom, questions could be asked either directly in the Zoom calls or pre-submitted to a dedicated email reflector for each lecturer. Both the lecture videos and the recorded Q&A sessions are (and will remain) available to ITSoc members via the video section on the recently updated itsoc.org.

The 159 registered participants had the opportunity to present their work in virtual poster sessions. Two identical poster sessions were held at different times of the day in order to accommodate participants from a variety of time zones. Poster presenters were

encouraged to be present in both of these sessions. We chose the avatar-based gather.town service in order to mimic an actual poster session as good as possible. That is, posters could be set up on virtual poster stands, presenters could “stand” right next to their posters with their avatars, and participants could “walk around”, read posters, and talk to presenters in proximity-based video chats. The gather.town format led to a couple of highly interactive situations and people got engaged in discussions in a way that would have been impossible in regular video calls. In order to guide participants through the poster sessions, each poster was announced by a short teaser video and a compilation of all teaser videos was made available together with the lecture videos on Vimeo.

It is quite sad that we could not welcome the lecturers and participants to Stuttgart and that we had to cancel our beautiful venue and the social events. Nevertheless, the school was a week full of exciting presentations and personal interactions. We also learned a few important lessons for future virtual events and the lecture videos constitute a valuable contribution to the ever-growing video collection of our Society.

We are thankful for all the work and dedication of the lecturers, session chairs, and volunteers. Together with the generous support by the IEEE Information Theory Society, this turned the first fully virtual school on Information Theory into a success.

Report on the 2021 IEEE North American School of Information Theory

Lutz Lampe, Lele Wang, Anas Chaaban and Ian Blake (co-organizers)

The 2021 IEEE North American School of Information Theory (NASIT) took place virtually from June 21 to 25, 2021, nominally hosted at the University of British Columbia, Canada. This 13th edition of the NASIT series was originally planned for 2020 but then deferred to 2021 due to COVID-19. More than 200 students and researchers from about 90 universities and institutes registered for the school.

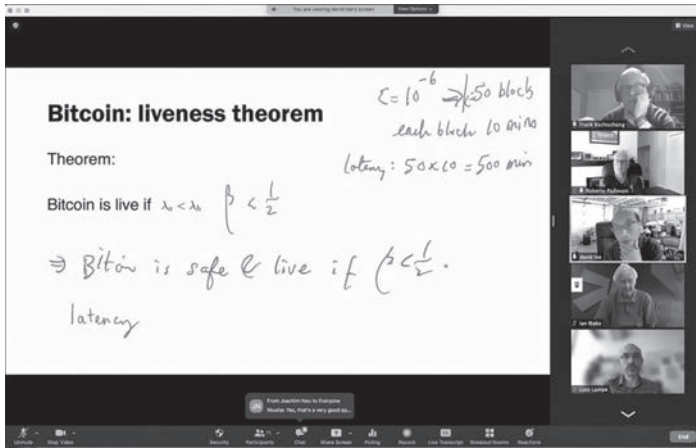
NASIT 2021 featured six outstanding tutorials, which were presented live via zoom and enjoyed large audiences. The school started with a tutorial on Massive Random Access and Massive MIMO presented by the President of the IT Society, Prof. Wei Yu from the University of Toronto. Prof. Yu explained the problem of massive connectivity and solution approaches based on activity detection possibly jointly with channel estimation, and he described the use of small amounts of feedback to enable scheduling for collision-free massive connectivity.

The next day opened with a tutorial by Prof. Negar Kiyavash from the École Polytechnique Fédérale de Lausanne. Prof. Kiyavash's tutorial topic was Network Causal Inference: Theory and Applications. Attendees learned fundamentals of causal inference including its definition, difficulties, structural equation models, graphi-

cal models, as well as its applications. This tutorial was followed by the first part of a two-part tutorial on Network Information Theory presented by Prof. Michelle Effros from the California Institute of Technology. This part of Prof. Effros' tutorial focused on reduction arguments in network information theory, and how they can be used to study large networks.

The third day of NASIT 2021 featured a tutorial on Post-quantum Cryptography From the Learning with Errors Problem by Prof. Douglas Stebila from the University of Waterloo. Professor Stebila introduced the application of techniques of lattice-based cryptography and the learning with errors problem in constructing quantum-resistant encryption and digital signatures. This was followed by the second part of the Network Information Theory tutorial by Prof. Michelle Effros, which focused on cooperation in network information theory.

Day four featured a tutorial on Understanding Deep Learning With an Information Geometric Method presented by Prof. Lizhong Zheng from the Massachusetts Institute of Technology. Prof. Zheng explained a geometric representation of information measures, the concept of an information vector and related properties, and connections of this geometric representation to machine learning.



The school was concluded with a tutorial on Speeding up Bitcoin presented by the Society's 2020 Padovani Lecturer, Prof. David Tse from Stanford University. In wonderful clarity, Prof. Tse laid out the roots of bitcoin, explained and in part derived the design choices that make it secure, pointed out its challenges, and presented a new protocol to reduce its latency. An additional highlight was the presence of Dr. Roberto Padovani during the tutorial.

Slides for five of the tutorial presentations are available at <https://conferences.ece.ubc.ca/nasit2021/tutorials.html>

The school also included two poster sessions on days one and four of the event. A total of 50 student posters were presented us-

ing the web-conferencing space Gather.town. This virtual format provided an interactive environment for discussions and professional networking between tutorial presenters and attendees. To stimulate submissions and quality presentations, a Best Poster Prize competition was held. The adjudicators Professors Andrew Eckford (York University), Aaron Gulliver (University of Victoria), and Ashish Khisti (University of Toronto) selected three winners of poster prizes. Congratulations to Debarab Mitra (University of California Los Angeles, 1st prize), Ning Zhang (University of British Columbia, 2nd prize), and Ecenaz Erdemir (Imperial College London, 3rd prize).

The event was a great success with excellent attendance and valuable interactions between presenters and audiences. The latter was greatly facilitated by Professors Robert Schober (University of Erlangen-Nuremberg), Bruce Hajek (University of Illinois at Urbana-Champaign), Gerhard Kramer (Technical University of Munich), Ian Blake (University of British Columbia), Christos Thrampoulidis (University of British Columbia), and Frank Kschischang (University of Toronto), who kindly agreed to serve as moderators for the tutorials.

We would like to sincerely thank all the presenters for the wonderful educational experiences they provided, and we are grateful to the Institute for Computing, Information and Cognitive Systems (ICICS) and the Centre for Artificial Intelligence Decision-making and Action (CAIDA), both at the University of British Columbia, for their generous financial support of NASIT 2021.

President's Column *(continued from page 1)*

There is also an interesting side story to this paper that showcases the spirit of collegiality in our community. Although the award-winning paper features six authors, the main result was derived independently and concurrently by two groups. As we all know, from the invention of the telephone to the discovery of the theory of evolution, such is not at all uncommon in the history of scientific progress. What was notable about this story is that the two groups decided to collaborate and to jointly co-author a single journal paper of their results. To me, this would be a reason to doubly congratulate the authors for their fine technical contributions and the spirit of collaboration.

The primary aims of our conferences are to promote technical excellence, and equally importantly, to build a vibrant, diverse, and inclusive community. Toward this end, the Diversity and Inclu-

sion Committee of the ITSoc has launched a Diversity and Inclusion Survey to take a pulse of our society. Diversity has many dimensions, including gender, race, geographic, nationality, and all aspects that make each of us a unique individual. The survey is completely anonymous, and is available at: www.surveymonkey.com/r/ITSoc. We hope to use the survey results to help formulate best practices and make offerings of our society truly inclusive to all. Please complete a survey, if you have not already done so.

I already look forward to ISIT 2022, which will be held in Finland, hopefully in person—but as the vaccines and variants situation continues to evolve, this is by no means a certainty. Nonetheless, I take comfort in knowing that even during extraordinary time when we can only meet each other virtually, our community stands as strong as ever.

In Memoriam: Michele Elia 1945–2021

*Carmelo Interlando, Joachim Rosenthal,
Massimiliano Sala, Giorgio Taricco, and Emanuele Viterbo*

Michele Elia passed away unexpectedly on April 7, 2021 at his home in Castiglione Torinese, in the Italian region Piedmont. He was a professor in the Department of Electronics and Telecommunications at the *Politecnico di Torino* for over 30 years, the last 3 as professor emeritus.

Michele was born in Berzano di San Pietro (AT), Italy, on January 2, 1945. He obtained the Dr. Engineering degree in Electronic Engineering from the *Politecnico di Torino* in 1970. Throughout his whole professional career, he contributed significantly in the areas of coding theory and cryptography. He was always fascinated with number theory and he studied historic papers from number theorists of the 18th and 19th century with great interest. His superb knowledge of mathematics influenced many of his papers.

In the 1970's he did joint work with Ezio Biglieri, in which he designed group codes for the Gaussian channel which were significant in the area of wireless communication. In particular, he obtained existence conditions for any group code in n -dimensional spaces, and he obtained constructive results for optimal cyclic group codes. In the early 1980s, he presented a lower bound on the size of linear codes, which improved the Varshamov bound in certain cases.

A few years later, he developed a clever decoding algorithm for cyclic codes: His paper on the decoding of the $(23, 12, 7)$ Golay code is a classic in this field as it provides an efficient way to decode many cyclic codes beyond the BCH bound.

In collaboration with Interlando and Palazzo in the 1990s, he generalized algebraic decoding algorithms of cyclic codes to cases where the codes were defined over integer residue rings.

In the 1990s, Michele also became a well-known researcher in the area of cryptography. In this area he published papers on steganography and several papers on (nonlinear) sequences. He has also been advising companies involved in the design of cryptographic machines.



His fascination with number theory resulted in about a dozen of papers with different co-authors on different topics of number theory. Of note, one of them contains observations about two equations introduced by Ramanujan and the existence of their solutions. Just one week before his untimely death he published on arXiv a paper entitled *Continued Fractions, Quadratic Fields, and Factoring: Some Computational Aspects* where he describes a new iterative algorithm which is capable of factoring square free integers in polynomial time once the class number and the regulator can be computed. The paper is fascinating as it might be feasible to compute the class number and the regulator in polynomial time.

Michele has been an inspiration for many young researchers in the information theory area. When e-learning was a completely new subject he was advising the Italian government on how one possibly could progress in this area. At the *Politecnico di Turin* he contributed significantly to make the telecommunication and information theory group a very strong group. In recent years Michele has been the President of a new Italian initiative in Cryptography called "De Componendis Cifris". We all will miss his presence, his kind personality and his advice.

IEEE Information Theory Society Board of Governors Meeting

Location: Remote

Date: June 6th, 2021

Time: The meeting convened at 9:30 am EDT; the meeting adjourned at 4:10 pm EDT

Meeting Chair: Wei Yu

Minutes taken by: Lara Dolecek

Meeting Attendees: Erik Agrell, Matthieu Bloch, Amitalok Budkuley (#), Robert Calderbank, Joseph Boutros (#), Themistoklis Charalambous (#), Marco Dalai (#), Michael Deering (#), Natasha Devroye, Suhas Diggavi, Alex Dimakis, Lara Dolecek, Stark Draper, Meir Feder, Christina Fragouli, Massimo Franceschetti, Andrea Goldsmith, Camilla Hollanti, Jerry Huang (#), Sid Jaggi, Tara Javidi, Vijay Kumar, Brian Kurkoski, Matt LaFleur (#), Olgica Milenkovic, Prakash Narayan, Henry Pfister, Joachim Rosenthal, Stefano Rini (#), Parastoo Sadeghi, Anand Sarwate, Emina Soljanin, Vincent Tan, Olav Tirkkonen (#), Daniela Tuninetti, Lalitha Vadlamani (#), Lele Wang (#), Edmund Yeh, Aylin Yener, Wei Yu.

Non-voting members are denoted by (#).

Business conducted between meetings.

- 1) In April 2021, the following motion was issued:

Motion: To allow a search for the Editor-in-Chief of the IEEE Transactions on Information Theory for an initial 2-year term starting July 1, 2021, and to allow the Transactions to transition into an area editor model, with the area editors appointed by the EiC, subject to BoG approval.

As this is a significant change of the editorial structure of the Transactions, President Yu solicited input and feedback from the BoG via a Google form.

The motion passed.

- 2) In May 2021, the following motions were issued.

Motion: To approve the minutes of the ITSoc BoG meeting on March 20, 2021.

The motion passed.

Motion: To approve the proposal of the organizers of ITW 2021, Kanazawa, Japan to go fully virtual, keeping in mind the local and global situation with respect to the pandemic.

The IT Society conference committee has examined the budget and is in support of this motion. The proposed budget along with attendant justification in the form of a PDF file, is attached. (Also attached are the original fully-in-person June 2019 proposal and budget).

The motion passed.

At 9:30 am EST, ITSoc President Wei Yu called the meeting to order.

Attendees introduced themselves. President Yu thanked everyone for joining the meeting.

Motion: A motion was made to approve the agenda.

The motion passed.

President's Report—Wei Yu

President Yu started by thanking everyone for their service. He then went over the mission of the ITSoc—our mission is to support open exchange of ideas in information theory, broadly construed, through publications, communications, meetings, outreach, education, mentoring, and recognition of excellence. The three pillars are community building, outreach, and teaching excellence. Next, President Yu went over the membership statistics and dues. Current society annual dues are \$25 for members and \$1 for student members. For 2022, these will be \$25 and \$5, respectively. For 2023, the dues for the preferred membership will be \$35 for members and \$10 for students; for essential membership will be \$15 for members and \$1 for students; membership dues for members from developing nations will be 50% of the essential dues; membership dues for members from low income economies will be 80% of the essential dues. Membership dues for 2022 and preferred membership dues for 2023 will include a printed copy of the BITS magazine.

Next, President Yu went over the status of the IEEE Transactions on Information Theory. Special issue published in June 2021 was dedicated to the memory of V.I. Levenshtein. Olgica Milenkovic was the Guest EiC. Next, President Yu thanked Igal Sason for his service as the EiC of the Transactions and Erdal Arikan for his service as the EE of the Transactions. There were three invited papers during Igal's term. The acceptance rate of the journal is around 50%. Impact factor of the Transactions was 3.036 in 2019. This number is computed by looking at the papers published in 2017-2018 and evaluating how many citations they had in 2019. Percentile rank of the Transactions was 90% 20 years ago and now it is 70% of all journals. In addition to USA and China, notable geographic representation of authors includes Israel, France, and Singapore.

President Yu then discussed the status of the Open Access and asked for feedback from BoG on whether the society should start a Gold Open Access journal. An ad-hoc committee on Open Access will be formed.

Next, President Yu briefly discussed the future of conferences and stated that 90 minutes of today's meeting will be devoted to the discussion on how to organize ISITs in the post-pandemic world. He stated that there were 750 respondents to the survey on this matter that had been sent out.

Next BoG meeting will be held in October. A straw poll: How likely will you travel to an in-person workshop on “Information Theory and X” as part of October BoG meeting, was issued. It was noted that international restrictions may still be in place in October.

The result of the straw poll was mixed: there were 15 votes for unlikely/very unlikely; 4 votes for neutral; 9 votes for likely/very likely.

Next, President Yu announced that the recipient of the Aaron D. Wyner Distinguished Service Award for 2021 is Gerhard Kramer.

Nominations and Appointments Committee—Emina Soljanin

Next presentation was given by Emina on behalf of the Nominations and Appointment Committee. Emina stated that Osvaldo Simeone is replacing Kannan Ramchandran on the Fellows Committee and that the 2021 work on appointing committee members is ongoing.

Emina presented the slate of the 2021 BoG election candidates. The slate consists of: Li Chen, Marco Dalai, Bikash Dey, Lara Dolecek, Stark Draper, Michael Langberg, Mehul Motani, Henry Pfister, Parastoo Sadeghi, Changho Suh, Sennur Ulukus, Shun Watanabe.

Emina stated that the call for the EiC of the IT Transactions was answered by four very strong candidates. The committee selected Muriel Médard, and she accepted the nomination.

Constitution and Bylaws Committee—Emina Soljanin

Emina next continued in her role representing the Constitution and Bylaws Committee. She asked if we should have VP for Publications. VP for Publications would oversee our three publications, lead Open Access plans, interact with the IEEE, among other duties. VP for Publications would be a BoG member whereas EiCs would not; this VP could be a past president or past IT Transactions EiC and could be appointed or elected. Emina said that the discussions regarding this position will continue over Slack.

President Yu asked if there were any additional nominations from the board for the slate of 2021 BoG election candidates. No additional candidates were nominated.

The following motion was issued.

Motion: To approve the slate of 2021 BoG Candidates.

The slate was approved.

Next, this motion was issued.

Motion: To approve Muriel Médard as the EiC of the IT Transactions.

The selection of the EiC was approved.

Next, President Yu proceeded with the Officer nominations. A BoG member nominated Christina Fragouli for President. Another BoG member nominated Matthieu Bloch for First VP. A BoG member

nominated Stark Draper as Second VP, and another BoG member nominated Daniela Tuninetti as Second VP.

Voting for the Officer positions will take place over the period of 3 weeks following this meeting.

FITS Initiative—Brian Kurkoski

Next presentation was given by Brian. He stated that the new itsoc.org website went live at the end of March. IEEE enabled single-sign-on. Despite a few minor bugs, site is working well. Brian also said that they are now working on the microsities for BITS, Newsletter, and Outreach. He also stated that the IT Transactions doesn't have a microsite, and that establishing it can be a new initiative. Brian also thanked Matthieu Bloch for his on-going help with the FITS Event Platform. Brian showed visual examples of the structure of the new microsities. He then provided the update on the Newsletter Microsite: in 2022, Newsletter will be exclusively online; microsite will be developed to accommodate the new format; there are ongoing discussions with Christina Fragouli, Rob Calnderbank, and Changho Suh about the content in BITS vs. Newsletter, but the site is mostly content-agnostic. The current status is that the specifications were sent to the developer with the estimated cost of \$12,160. Brian said we will have a working site before January 2022. Next, Brian presented the status of the Outreach Microsite. It targets non-IEEE members and links to external resources: Shannon movie, Information in Small Bits book, animated cartoons, “art of the problem” videos, and student video competition. The estimate to develop this site is \$3,340. Current status is a preliminary wireframe. A BoG member asked whether it would be possible to add hand populated list of contents for members only. Brian said it would be possible but may take some work.

IT Schools Update—Parastoo Sadeghi

Next presentation was given by Parastoo Sadeghi in her role as the Schools Subcommittee Chair. She presented the motion to support ESIT 2022. Specifically, the organizers requested funds for plan A in the amount of €12,800. She stated that ESIT 2020 had been approved for around €13,000, and referred to the supplementary material for interested parties for more details as well as for plan B/C budget estimates.

Next, she presented the status of the upcoming schools. NASIT 2022 will be held in Los Angeles and Rick Wesel is leading this effort. EASIT 2022 will be held in Shenzhen, China. General co-chairs are Li Chen and Shao-Lun Huang. Proposal has been received and is under review/revisions; six speakers are confirmed. JTG/IEEE ITSoc India School 2022, IIT, Mandi is led by Satyajit Thakor. Pre-proposal details have been received and pre-vetted by the Schools Subcommittee Chair; two keynote lecturers and two invited lecturers are confirmed. It was noted that the budget for EASIT was revised from \$20K down to \$3.6K.

There was some discussion regarding ESIT 2022. A BoG member clarified that this school was a carryover from 2021 as no European school was held in 2021. It was also clarified that the school organizers are not always themselves presenting their proposal at the BoG meeting and that often the committee presents on their behalf. A BoG member also added that this school was already vetted twice. There was some concern about some

speakers being outside of the Information Theory area. It was noted that the speakers are of international stature. A BoG member asked that the school presentations be detailed enough in the future for assessment even if presented by the school committee.

Motion: To support ESIT 2022 in the amount of \$15.5K.

The motion was approved.

Conference Committee—Vijay Kumar

Next presentation was given by Vijay in his role of the Conference Committee Chair. Vijay thanked all the committee members for their continued service. He welcomed new members: Henry Pfister and Parastoo Sadeghi. Vijay stated that in light of the current situation, all events need to be revisited.

Next, Marco Dalai provided the update on ITW 2020. There were 160 submissions and 106 accepted papers. There were 25 invited talks, 6 plenaries, and 2 tutorials. Marco went over the attendance statistics, and budgets for cost and income. He also stated that the communication with MCE was difficult and exhausting. BoG thanked Marco and the rest of the conference organizing team for all their hard work, as they first had to postpone the (in-person) conference, then hold it virtually.

Next presentation was given by Brian Kurkoski on behalf of the ITW 2021 organizing committee. Brian stated that the workshop had to switch to the fully remote mode as the visitors cannot enter Japan. BoG had approved this change along with the new format and budget. Brian clarified that there is no cancellation fee as no contract was signed. He went over the paper charge and participation fee. He also stated that the budget for interactive sessions on Zoom had not been budgeted for so the currently projected surplus may not end up being as high. Brian stated that he would like to see support from BoG for interactive sessions.

After Brian concluded his presentation, Navin Kashyap presented the proposal for ITW 2022 to be held in Mumbai, India. He stated that the workshop was originally planned to be held in Goa, but that it was subsequently moved to Bombay (Mumbai). Workshop would be held as a hybrid event with a fully virtual back up plan. Navin stated that the selected venue is flexible size-wise and the cost is acceptable, and that Bombay is well connected. Navin went in detail over the key dates and milestones; the list of topics of interest; the daily breakdown of the schedule in the hybrid mode, discussing both the virtual and the in-person component, as well as the daily breakdown of the schedule in the fully virtual mode. He presented the budget for both scenarios, and registration charges. In summary, he said that the IT community in India is very vibrant and that this event would only be the second time in two decades ITW is held in India, and that as a result considerable interest is anticipated. It was also recognized by BoG that there were several members of the conference organizing committee who are young researchers.

The following motion was issued.

Motion: To approve the proposal from the ITW 2022 India organizing committee.

The motion passed.

Next presentation was given by Joseph Boutros. He presented the preproposal for ITW 2023 to be held in Saint Malo, France. Target date is April 2023. He showed images of the location and said the convention center is 10 minutes from the old city. He stated that the plan is to decrease registration fee for students and to pursue further sponsorship after the formal approval.

After Joseph concluded, Henry Pfister provided the update on ISIT 2021. Henry explained that the short time for paper uploads was due to the constraints from the vendor, as the initial deadline was extended by two weeks and the winter storm had impacted computer resources. Statistics of the technical program were presented. Henry stated that there is a lot of work done being the scenes to ensure the quality of the program including checking videos uploaded by the presenters.

Next presentation was given by Themistoklis Charalambous on behalf of the ISIT 2022 organizing committee. The conference is scheduled to take place in Espoo, Finland, in June-July 2022. The committee anticipates in person attendance from countries with high vaccination rates. It was clarified that the hybrid mode can be more expensive than the in-person mode. The committee plans for high volatility, and if the in-person attendance is at 20-30% or below, they would switch to fully virtual.

Next presenter was Stefano Rini who provided the update on ISIT 2023 to be held in Taipei, Taiwan. The preference of the organizing committee is to hold the conference in person. He presented the details of the virtual and in-person segments, stating that they would have separate deadlines. There will be a no-video no-show rule for the virtual segment.

Anand Sarwate was the next presenter. He presented the preproposal for ISIT 2024 to be held in New York. He went over the local attractions and the organizing committee. He said that Cythia Rush from Columbia will be responsible for local arrangements. Anand stated that a major binary decision needs to be made regarding whether ISIT will be held in the traditional or in the "fusion" style. The former would entail a large in-person participation and booking of a hotel such as Hilton in Times Square. The latter would entail a cap on in-person attendance and the venues would be at NYU or Columbia. He stated that there is 300 room booking requirement at Hilton but there are many other hotels participants can choose from. A BoG member expressed a concern that 5 TPC chairs maybe too many and it would not be clear who is in charge. There was also a concern that 4th of July weekend being a US holiday may not be good for participants with families.

Next presentation was given by Vijay Kumar on the Survey on the Format of a Possible Hybrid ISIT in the Future that had been sent out to the community, with over 750 respondents. Vijay presented in detail the statistical breakdown of the multiple choice answers.

In the ensuing discussion, there was some concern on the BoG that hybrid will default to fully virtual. Vijay summarized that based on the answers to one of the questions on the survey, there is lukewarm support in the community for either option of spreading the in-person component over more days vs. fewer days. A BoG member commented that in the hybrid mode, local arrangements as well as virtual organization need to be made and that this requires two sets of vendors, complicating the overall organization and coordination. A comment was

made to restrict the in-person component in order to restrict travel for climate reasons.

Two straw polls were issued:

- 1) Given the conference survey results, the BoG requests future ISIT organizers to institute a hybrid format for the next 2–3 ISITs. The BoG recognizes the considerable uncertainty in in-person attendance numbers for hybrid ISITs and is willing to provide backstop to ensure the financial viability of the conference.
- 2) Given the conference survey results, the BoG requests future ISIT organizers to keep in mind, the following guidelines in organizing a trial hybrid ISIT over the next 2–3 years:
 - a) A hybrid ISIT should be structured so as to encourage in-person attendance;
 - b) A hybrid ISIT should not increase the cost of in-person attendance as compared to a traditional ISIT;
 - c) A hybrid ISIT should prioritize in-person experience while providing as good a virtual experience as possible.

For the both straw polls, the majority answered in the affirmative.

After a short break, the meeting continued.

IEEE Foundation Presentation— Michael Deering

Next presentation was given by Michael Deering from the IEEE Foundation who manages donation accounts. He went over the *Realize the Full Potential of IEEE* campaign, stated the mission of the foundation, described the societal impact of the campaign, described how the foundation engages a wider audience in appreciating the value and importance of engineering and technology. He stated that 2.9% of \$32.1M raised in the campaign will be devoted to the IT Society. He talked about how foundation supports the Padovani Lecturer, Goldsmith Lecturer and Shannon Centennial programs.

Treasurer Report—Edmund Yeh

Edmund started his presentation with the overview of the IEEE accounting, specifying that the surplus of general funds gets split evenly between the reserves and special projects (50% spending each) for the following year and that additionally 3% of reserves can be used for the special projects. He next went over the 2020 general funds and stated that the final end-of-the-year operational surplus was \$774.5K. This end value was due to several contributing factors, most notably an increase in revenue for the IT Transactions and JSAIT and the decrease in conference and meeting expenses. For the 2021 general funds, year-to-date surplus is \$170.5K. Next, Edmund went over the special projects for 2020 and for 2021.

The following motions were issued.

Motion: To approve 50% Spending of the General Funds for the following projects, in the total amount of \$120K:

- Art of Information Theory: \$40K

- Graphic art with resource center
- Distinguished lecture editing
- Information Theory and X workshop: \$80K.

Motion: To approve 3% Spending of the reserves, in the total amount of \$150K:

- Webservice upgrade: \$30K
- Future of the Information Theory Society (FITS): \$50K
- Magazine marketing: \$20K
- Information Theory and X workshop: \$50K.

The two motions passed.

IEEE BITS Magazine—Rob Calderbank and Christina Fragouli

Next presentation was given by Rob as the EiC and Christina as the Chair of Steering Committee for the IEEE BITS Magazine. Rob went over the Editorial Board, including Editors and Column Editors, timeline for the upcoming issues, the list of invited papers to date, and the division of content between the magazine and the newsletter. Rob thanked Christina for the effective organization. Website for the magazine was shown and the IEEE administrative assistant was introduced. Rob thanked Anand Sarwate and Brian Kurkoski for their work on the website. Manuscript Central submission portal opened on June 1st 2021. Rob encouraged submission of new articles. Christina added that the first few years are important to set the right tone moving forward and echoed that strong contributions are important.

Paper Awards Committee— Christina Fragouli

Next presentation was given by Christina on behalf of the Paper Awards Committee.

Votes were issued to accept the report of the Paper Awards Committee and for the IT Society Paper Award. Only members without conflicts were permitted to vote.

The Paper Award Committee's report was accepted. The BoG voted to accept the Paper Awards Committee's recommendation of the ITSoc Paper Award recipient.

After the executive session, the next presenter was Tara Javidi.

Massey Award Committee—Tara Javidi

Tara went over this year's selection process for the Massey Award. She stated that six excellent nominations were received by the committee. The committee selected Prof. Changho Suh from KAIST as the recipient of the award. She stated that three of the nominations can carry over to the next year and suggested that it would be good to involve department chairs and advertise the award broadly.

Cover Dissertation Award Committee— Roy Yates

Roy went over the nominations the committee had received, and stated that the committee had selected Dr. Anuran Makur who had received a PhD degree from MIT as the recipient of the award.

JSAIT Update—Jeff Andrews

Jeff went over the executive summary and stated that JSAIT is overall doing well. The number and quality of submissions is healthy with the acceptance rate of around 2/3. First five issues are already published. Jeff went over the submission data for the issues. Next he went over the timeline for the next three upcoming issues. Jeff presented the budget and stated that JSAIT had a profit of over \$76K to date. He next went over the editorial board, including the EiC, senior editors, and the steering committee. The call for the new EiC will be issued by July 1st, 2021, and the 3-year term of the new EiC will start on January 1st, 2022. Jeff also stated that senior editors should be appointed in staggered order. He also stated that a goal for the journal is to increase the number of unsolicited proposals.

Proposal for Tutorial/Overview Paper Award— Suhas Diggavi

The next presenter was Suhas. He first explained the rationale for introducing a tutorial award. He then asked that this award be named after the late Joy Thomas. Suhas went over Joy's biography and accomplishments, and recalled how he himself had heard of Joy when he was a middle schooler in India. He went over the details of the Joy Thomas Foundation.

The following motion was issued.

Motion: To approve the institution of a J. Thomas Information Theory Tutorial Award that recognizes exceptional tutorial publications in the field of information theory.

The motion passed.

Next, the following motion was issued.

Motion: To extend the meeting by 45 minutes.

The motion passed.

External Nominations Committee— Muriel Médard

Muriel went over the goals for the committee for this year, the committee members, and the summary of their recent activities.

Diversity and Inclusion Committee— Stark Draper

Stark gave the presentation as the Chair of the Diversity and Inclusion Committee. He thanked other committee members for their service. Updates since the last BoG meeting included ITSoc Scholarships for undergraduates from groups currently underrepresented in ITSoc for which the nominations are due June 7th; events at ISIT 2021; and the preparation plans for the D&I climate survey, which will be sent out to the community in the near future.

Membership Committee— Matthieu Bloch

President Yu presented on behalf of Matthieu. He went over the committee members, chapter and school activities. He then went over the structure of the Meet the Shannon Lecturer event. Prof. Alon Orlitsky is the winner of the 2021 Shannon Award. This event will be a recorded interview conducted by Olgica Milenkovic and Jayadev Acharya. Next, Wei went over the details of the mentoring event that will take place at ISIT 2021. The purpose of the event is to connect junior researchers with senior members of the community, who can share their career advice and experiences. Last, Wei described the Four Minutes, Two Techniques Contest. This online challenge is for registered ISIT student participants who in teams of two explain each other one concept each. Winning videos will be posted on the ITSoc webpage and the winning team will receive a monetary award.

It was stated that WITHITS report will be presented another time.

President Yu relayed a message from Sennur Ulukus, as the Chair of the Fellows Committee. Sennur's message is that the committee is short staffed and needs more support.

The meeting adjourned at 4:10 pm EST.

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Call for Papers: Due August 1, 2021

Manuscripts can be submitted from July 1-August 1, 2021 with the submission deadline of August 1st being firm. Please follow the instructions at allerton.csl.illinois.edu.

CONFERENCE CO-CHAIRS | ALEJANDRO DOMINGUEZ-GARCIA AND MAX RAGINSKY

INFORMATION FOR AUTHORS | INVITED papers suitable for presentation in 20 minutes are solicited.

PAPERS PRESENTING ORIGINAL RESEARCH ARE SOLICITED IN THE AREAS OF:

- Biological Information Systems
- Coding Techniques and Applications
- Coding Theory
- Data Storage
- Information Theory
- Multiuser Detection and Estimation
- Network Information Theory
- Sensor Networks in Communications
- Wireless Communication Systems
- Intrusion/Anomaly Detection and Diagnosis
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- Robust and Nonlinear Control
- Adaptive Control and Automation
- Robotics
- Distributed and Large-Scale Systems
- Complex Networked Systems
- Optimization
- Dynamic Games
- Machine Learning and Learning Theory
- Signal Models and Representations
- Signal Acquisition, Coding, and Retrieval
- Detection and Estimation
- Learning and Inference
- Statistical Signal Processing
- Sensor Networks
- Data Analytics
- Power System Control and Optimization

IMPORTANT DATES | 2021

AUGUST 1— Submission Deadline

AFTER AUGUST 9 — Registration Opens

SEPTEMBER 29 - OCTOBER 1 — Conference Dates

September 28 — Opening Tutorial Lectures at the National Center for Supercomputing Applications (NCSA), 1205 W. Clark Street, Urbana, IL, University of Illinois at Urbana-Champaign: TBA

September 29- October 1 — Conference Sessions at the University of Illinois Allerton Park & Retreat Center. The Allerton House is located 26 miles southwest of the Urbana-Champaign campus of the University of Illinois in a wooded area on the Sangamon River. It is part of the 1,500 acre Robert Allerton Park, a complex of natural and man-made beauty designated as a National natural landmark. Allerton Park has 20 miles of well-maintained trails and a living gallery of formal gardens, studded with sculptures collected from around the world.

OCTOBER 3 — Final Paper Deadline

I ILLINOIS

The Allerton Conference is co-sponsored by the **Coordinated Science Lab** and the **Department of Electrical and Computer Engineering**.

WEBSITE | allerton.csl.illinois.edu EMAIL | pwells@illinois.edu

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IEEE Journal on Selected Areas in Information Theory

Special Issue on Information Theoretic Foundations of Future Communication Systems

Information theory, starting with Shannon's groundbreaking work, has fundamentally shaped the way communication systems are designed and operated. Information theoretic principles form the underpinnings of modern wireless and wired networks. This special issue will focus on exploring how new advances in information theory can impact future communication systems. Next generation wireless networks will incorporate a large number of devices, dense and intelligent antenna arrays, and operate in higher frequencies. New task-aware communication modalities, such as sensing, learning and inference, will accelerate the shift from human-to-human to machine-to-machine type communications. Accordingly, communication systems will be designed with capacity, latency and accuracy in mind. Increasingly complex communication tasks will need to be carried out on devices with energy and hardware constraints, but will also be able to take advantage of in-network storage and computation.

Authors are encouraged to submit their work on topics including, but not limited to:

- Communication for learning, inference, sensing
- Communication in high frequency (mmWave, THz, optical) bands
- Communication models and analysis emerging from new protocol requirements
- Communication models and analysis that account for the advances in physics and electromagnetism
- Energy-efficient communication, energy harvesting
- Finite blocklength information theory
- Fundamental limits of communication-computing convergence
- Hardware/complexity constrained communications
- Latency and age of information
- Multi-user information theory, including uncoordinated massive random access

Important Dates:

Manuscript Due: September 1, 2021

Acceptance Notification: February 15, 2022

Camera-ready Version: March 5, 2022

Expected Publication: March/April 2022

Senior Editor: Giuseppe Caire

Guest Editors: Elza Erkip (Lead), Giuseppe Durisi, Robert Heath, Thomas Marzetta, Petar Popovski, Sennur Ulukus, Meixia Tao

Submission Guidelines:

Submitted papers should be of sufficient length and detail for review by experts in the field.

Prospective authors must follow the *IEEE Journal on Selected Areas in Information Theory*

manuscript submission guidelines in [JSAIT Author Information webpage](#). All papers should be submitted through <https://mc.manuscriptcentral.com/jsait-ieee>



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ITW2021

October 17–21, 2021 in Kanazawa, Japan

The 2021 IEEE Information Theory Workshop (ITW2021) is currently scheduled to be held October 17-21, 2021 as a hybrid in-person/online event. The in-person component will be held at Kanazawa Bunka Hall in Kanazawa, Japan. If it becomes necessary to hold an online-only event, every effort will be made to provide networking opportunities and an interactive experience, while remaining a venue for dissemination of top-quality research in information theory.

Kanazawa is located in the middle of Honshu, the main island of Japan, and can conveniently be reached by train or airplane from Tokyo. Bordered by the Sea of Japan and the Japanese Alps, Kanazawa was also recognized as the world's first UNESCO Creative City in the field of crafts and folk art. Kanazawa Bunka Hall is centrally located in Kanazawa, with easy access to hotels, restaurants and transportation.

Call for Papers

Interested authors are invited to submit papers describing novel and previously unpublished results on all areas on coding and information theory, including but not limited to the focus topics below:

- ▶ Low-Latency Communications
 - Low-latency communications in multi-user information theory
 - Low-latency communications for wireless applications
 - Application of low-latency communications techniques
- ▶ Information-Theoretic Security
 - Physical layer security
 - Secure computation under information-theoretic security
 - Information-theoretic security for privacy
- ▶ Machine Learning for Communications
 - Neural networks for communication systems
 - Machine learning-based transceiver algorithms
 - Information-theoretical understanding of deep learning
- ▶ Codes in the Cloud
 - Coded computation
 - Private information retrieval
 - Distributed storage

Paper Submission

Authors should submit papers according to the guidelines which will later appear at:

<http://itw2021.org>

Accepted papers will appear in the symposium proceedings. To be published in IEEE *Xplore*, an author of an accepted paper must register and present the paper. IEEE does not guarantee inclusion in IEEE *Xplore*.

Paper submission deadline May-7 May 14, 2021

Acceptance notification August 2021

Further information will be posted on the symposium web site as it becomes available.

REDUNDANCY 2021



XVII International Symposium "Problems of Redundancy in Information and Control Systems" is the conference that covers a wide area of information and communication systems.

IMPORTANT DATES

Regular paper submission deadline: 1 July 2021
 Notification of acceptance: 31 August 2021
 Camera ready paper submission: 1 October 2021

25-29 OCTOBER 2021

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 MOSCOW, RUSSIA

MORE INFORMATION

MIEM.HSE.RU/REDUNDANCY2021

COVERED TOPICS

- Information and coding theory
- Mobile and wireless communications
- Telecommunication protocols
- Internet of things
- Data security
- Blockchain



2022 International Zurich Seminar on Information and Communication

March 2 – 4, 2022



The 2022 International Zurich Seminar on Information and Communication will be held at the Hotel Zürichberg in Zurich, Switzerland, from Wednesday, March 2, through Friday, March 4, 2022.

High-quality original contributions of both applied and theoretical nature in the following areas are solicited:

Wireless Communication	Optical Communication
Information Theory	Fundamental Hardware Issues
Coding Theory and its Applications	Information Theory and Statistics
Detection and Estimation	Network Information Theory and Coding
Data Storage	Cryptography and Data Security

Invited speakers will account for roughly half of the talks. In order to afford the opportunity to learn from and communicate with leading experts in areas beyond one's own specialty, no parallel sessions are anticipated. All papers should be presented with a wide audience in mind.

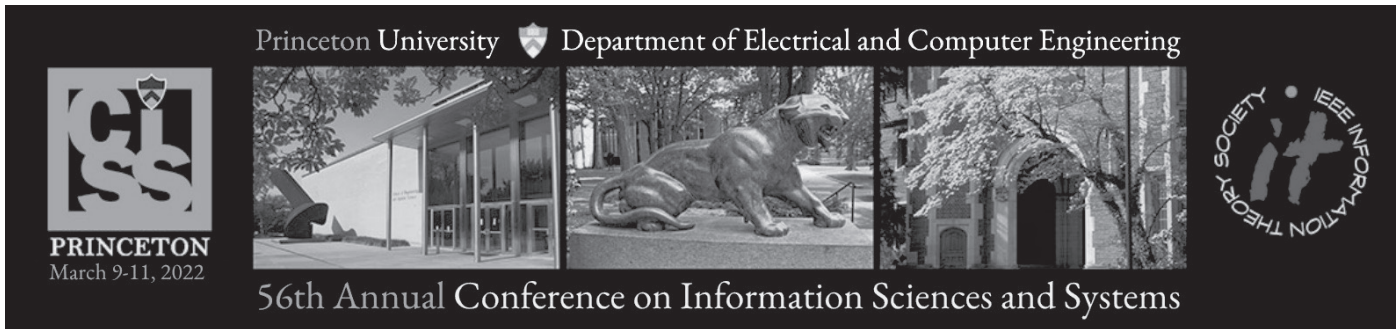
The conference will be held in person or not at all. The decision will be taken by January 10, 2022. If called off, authors of accepted papers will be given the choice between retraction and publication sans presentation.

Papers will be reviewed on the basis of a manuscript (A4, not exceeding 5 pages) of sufficient detail to permit reasonable evaluation. Authors of accepted papers will be asked to produce a manuscript not exceeding 5 pages in A4 double-column format that will be published in the proceedings. Authors will be allowed twenty minutes for presentation.

The submission deadline is **September 26, 2021**. More information will be posted at

<https://www.izs.ethz.ch/>

We look forward to seeing you at IZS.
Amos Lapidoth and Stefan M. Moser, Co-Chairs



Call for Papers

56th Annual Conference on Information Sciences and Systems

March 9, 10, & 11, 2022

**Princeton University-Dept. of Electrical and Computer Engineering
and Technical Co-sponsorship with the
IEEE Information Theory Society**

Authors are invited to submit previously unpublished papers describing theoretical advances, applications, and ideas in the fields of information sciences and systems including:

- Information Theory
- Coding Theory
- Image Processing
- Communications
- Signal Processing
- Machine Learning
- Big Data Analytics
- Reinforcement Learning
- Optimization
- Statistical Inference
- Security and Privacy
- Energy Systems
- Networks, Systems & Control
- Deep Learning
- Biological Systems

Electronic submissions of up to 6 pages (in Adobe PDF format) including 3-4 keywords must be submitted by **December 1, 2021**. Submissions should be of sufficient detail and length to permit careful reviewing. Authors will be notified of acceptance no later than **January 11, 2022**. Final manuscripts of accepted papers are to be submitted in PDF format no later than **January 18, 2022**. These are firm deadlines that will permit the distribution of electronic proceedings at the conference. Accepted papers will be allotted 20 minutes for presentation, and will be reproduced in full (up to 6 pages) in the conference proceedings. IEEE reserves the right to exclude a paper from post-conference distribution (e.g., removal from IEEE Xplore) if the paper is not presented by the author at the conference.

For more information visit us at: <http://ee-ciss.princeton.edu/>

CONFERENCE COORDINATOR	PROGRAM DIRECTORS	IMPORTANT DATES
<p>Lisa Lewis Dept. of Electrical and Computer Engineering Princeton University Princeton, NJ 08544 Phone: (609) 258-6227 Email: ciss@princeton.edu</p>	<p>Mengdi Wang Chi Jin Dept. of Electrical and Computer Engineering Princeton University Princeton, NJ 08544</p>	<p>Paper submission deadline: December 01, 2021</p> <p>Notification of acceptance: January 11, 2022</p> <p>Final accepted manuscript due: January 18, 2022</p>



2022 IEEE
INTERNATIONAL SYMPOSIUM
ON INFORMATION THEORY
JUNE 26–JULY 1 AT AALTO UNIVERSITY
IN ESPOO, FINLAND



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IEEE International Symposium on Information Theory (ISIT) is the flagship international conference dedicated to the advancement of information theory and related areas.

Interested authors are encouraged to submit previously unpublished contributions from a broad range of topics related to information theory, including but not limited to the following areas:

- Coding Theory and Applications
- Coded and Distributed Computing
- Combinatorics and Sequences
- Communication Theory
- Compressed Sensing and Sparse Representation
- Cryptography
- Decoding
- Detection and Estimation
- Distributed Storage
- Emerging Applications of IT
- Fairness in Machine Learning
- Information Measures
- Information in Decision and Control
- Information Theory in Biology and Neuroscience
- Information Theory in Computer Science and Computation
- Information Theory in Data Science
- Learning Theory
- Network Coding and Applications
- Network Data Analysis
- Network Information Theory
- Optical Communication
- Machine Learning
- Privacy
- Quantum Information Theory
- Security
- Shannon Theory
- Signal Processing
- Statistics
- Source Coding and Data Compression
- Wireless Communication

Submitted and published manuscripts should not exceed 5 pages in length, **plus an optional extra page containing references only**. Submitted manuscripts should be of sufficient detail to be evaluated by expert reviewers in the field.

We look forward to your participation in ISIT 2022!

Important dates

January 15, 2022 23.59 ET

Paper submission deadline

April 22, 2022

Acceptance notification



isit2022.org



ESIT'22 Call for Participation

The IEEE European School of Information Theory (ESIT) is an annual educational event, organized by the IEEE Information Theory Society (ITSoc), for graduate students, postdocs and researchers from institutes throughout Europe and beyond. The objective of the school is to provide participants with the opportunity (i) to learn from distinguished lecturers by attending long-format tutorials, (ii) to present their own work to obtain feedback and to start up collaborations, (iii) to hear about applications of information theory in industry, and (iv) to participate in a stimulating and inviting forum of scientists.

In 2022, we plan to bring the school back to an on-site format at Technical University (TU) Wien in Vienna, Austria, to fully embrace the community experience through on-site plenary talks, an online lecture with live Q&A session, and interactive attendee poster sessions, complemented by social events. In case an on-site event is still not possible, due to the global pandemic situation, we will offer a hybrid/virtual format.

Dates: The school starts on Sunday, **July 3rd**, evenings with a welcome reception and ends on Thursday, **July 7th**, afternoons.

Venue: The school is hosted by **Technical University (TU) Wien**, Austria's largest technical university teaching approximately thirty thousand students.

Location: The school takes place in **Vienna, Austria's** capital city with approximately 1.9 million inhabitants, famous for its rich culture, imperial sights, palaces, museums, theaters and opera houses, as well as, its cozy wine taverns and coffee houses.

Program: The school will feature five on-site plenary tutorial lectures plus two online lectures with live Q&A sessions. In addition, there will be two poster sessions, including elevator pitches, with contributions from attendees. The technical program will be complemented by a number of social events.

Registration: The registration platform will open in early 2022. Reduced registration fees for IEEE members and especially for IEEE ITSoc members will be offered.

Additional information will be provided on our school website:

<https://www.itsoc.org/conferences/schools/ESIT2022>

Conference Calendar

DATE	CONFERENCE	LOCATION	WEB PAGE	DUE DATE
September 27–30, 2021	The 22nd IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)	Lucca, Italy (virtual)	https://www.spawc2021.com/	Passed
September 29–October 1, 2021	The 58th Annual Allerton Conference on Communication, Control, and Computing	Allerton, University of Illinois at Urbana-Champaign, USA (in person & by only invited sessions)	https://allerton.csl.illinois.edu/	July 8, 2021
October 4–6, 2021	IEEE Conference on Communications and Network Security	Virtual Conference	https://cns2021.ieee-cns.org/	June 17, 2021
October 17–21, 2021	IEEE Information Theory Workshop (ITW)	Kanazawa, Japan (virtual)	http://itw2021.org/	Passed
October 18–21, 2021	The 19th International Symposium on Modeling and Optimization in Mobile, Ad hoc, and Wireless Networks (WiOpt)	Philadelphia, PA, USA (virtual)	http://www.wi-opt.org/cfp.html	Passed
October 25–29, 2021	XVII International Symposium Problems of Redundancy in Information and Control Systems	Moscow, Russia (hybrid)	https://miem.hse.ru/ru/redundancy2021/call-for-papers	Passed
December 6–14, 2021	The 35th Conference on Neural Information Processing Systems (NeurIPS)	Virtual Conference	https://nips.cc/	Passed
December 7–11, 2021	IEEE Global Communications Conference (GLOBECOM)	Madrid, Spain (hybrid)	https://globecom2021.ieee-globecom.org/	Passed
February 7–10, 2022	62nd Annual IEEE Symposium on Foundations of Computer Science (FOCS)	Boulder, Colorado, USA (in person)	https://focs2021.cs.colorado.edu/	June 3, 2021
February 22–March 1, 2022	36th AAAI Conference on Artificial Intelligence (AAAI)	Vancouver, BC, Canada (in person)	https://aaai.org/Conferences/AAAI-22/	September 8, 2021
March 2–4, 2022	International Zurich Seminar on Information and Communication (IZS)	Zurich, Switzerland (in person)	https://www.izs.ethz.ch/	September 26, 2021
March 9–11, 2022	56th Annual Conference on Information Sciences and Systems (CISS)	Princeton University, NJ, USA (virtual)	https://ee-ciss.princeton.edu/	December 1, 2021
March 30–April 1, 2022	The 25th International Conference on Artificial Intelligence and Statistics (AISTATS)	Valencia, Spain (in person)	https://aistats.org/aistats2022/	October 15, 2021
April 10–13, 2022	IEEE Wireless Communications and Networking Conference (WCNC)	Austin, TX, USA (in person)	http://wcnc2022.ieee-wcnc.org/	September 15, 2021
April 25–29, 2022	The 10th International Conference on Learning Representations (ICLR)	Virtual Conference	https://iclr.cc/	October 5, 2021
June 26–July 1, 2022	IEEE International Symposium on Information Theory (ISIT)	Aalto University, Espoo, Finland (in person)	https://www.isit2022.org	January 15, 2022
July 3–7, 2022	IEEE European School of Information Theory (ESIT)	Vienna, Austria (in person)	https://www.itsoc.org/conferences/schools/ESIT2022	—