

IEEE Information Theory Society Board of Governors Meeting

Location: Catamaran Resort Hotel, San Diego, CA

Date: 12 February 2017

Time: The meeting convened at 1:05pm PST (GMT-7); the meeting adjourned 5:15pm PST.

Meeting Chair: Rüdiger Urbanke

Minutes taken by: Stark Draper

Meeting Attendees: Matthieu Bloch, Suhas Diggavi, Alex Dimakis, Stark Draper, Michelle Effros, Elza Erkip, Christina Fragouli, Andrea Goldsmith#, Stephen Hanly, Matt LaFleur#, Pierre Moulin, Prakash Narayan, Krishna Narayanan, Alon Orlitsky, Vincent Poor, Anand Sarwate#, Anna Scaglione#, Emina Soljanin, Daniela Tuninetti, Rüdiger Urbanke, Emanuele Viterbo, Michelle Wigger*, Greg Wornell*, Aylin Yener, Wei Yu. (Remote attendees denoted by *, non-voting attendees by #.)

The IEEE Information Theory Society (ITSoc) president Rüdiger Urbanke called the meeting to order at 1:05pm. Two motions were approved by the ITSoc Board of Governors (BoG) by email voting since the October 2016 meeting:

1. The minutes of the October 2016 BoG meeting were approved.
2. A \$20k USD request to support the 2017 North American School for Information Theory (NASIT'17) to be held at Georgia Tech was approved.

Rüdiger next reviewed the meeting agenda.

Motion: A motion was made to approve the agenda. The motion was seconded by Tara Javidi. The motion was passed unanimously.

- 1) **President's Report:** Rüdiger presented the President's report. Rüdiger started by thanking society members for their concluding (and beginning) service on and to the BoG. He first thanked Abbas El Gamal for his service as President and officer of the ITSoc. He then welcomed Emina into the presidential sequence. Rüdiger next welcomed incoming BoG members: Alexander Barg, Alex Dimakis, Christina Fragouli, Prakash Narayan, Tara Javidi, Michelle Wigger, Gregory Wornell. He thanked Aylin Yener for staying as chair of the Schools Subcommittee for one additional year. He welcomed Helmut Bölcskei as the new chair of the Massey Committee. He also recognized Prakash Narayan as the new Editor-in-Chief (EiC) of the Transactions and Alexander Barg as the new Executive Editor of the Transactions. Rüdiger thanked retiring ("boggling-out") BoG members for their service: Abbas El Gamal, Tracey Ho, Frank Kschischang, Nick Laneman, Stephen ten Brink, Alexander Vardy, Emanuele Viterbo. He also thanked Frank Kschischang for his service as Transactions EiC and Nick Laneman for his service as head of the Massey Committee. He welcomed Andrew Barron, who has been reelected, back to the BoG as a regular member.

Rüdiger next congratulated all members of the Information Theory society that were elevated to Fellow status in the class.: Ravi Adve, Alexei Ashikhmin, Huaiyu Dai, Xinzhou Dong, James Fowler, Michael Gastpar, Stephen Hanly, Masahito Hayashi, Amir Khandani, Witold Krzymien, Teng-Joon Lim, and Xiajun Lin.

Rüdiger reported that a large number of society members that were recipients of significant honors this year. Andrea Goldsmith was elected to the U.S. National Academy of Engineering. Kannan Ramachandran received the IEEE Koji Kobayashi Computers and Communications Award. Vincent Poor received the IEEE Alexander Graham Bell Medal.

Shlomo Shamai received the IEEE Richard W. Hamming Medal. Martin Vetterli received the IEEE Jack S. Kilby Signal Processing Medal. Stephen Boyd received the IEEE James H. Mulligan, Jr. Educational Medal. Kees Schouhamer Immink received the IEEE Medal of Honor, the top award bestowed by the IEEE. On a light note, Rüdiger congratulated Polar codes for their adoption into the 5G standards!

Three new Information Theory Society chapters were established this year: in India, in Italy, and in Switzerland.

Rüdiger then provided updates from the IEEE Technical Activities Board (TAB) meeting in New Orleans. New ad-hoc committees have been formed this year to further IEEE contributions in four multi-disciplinary areas and to bring IEEE technology and technical expertise to bear in each. The focus areas include “Food engineering”, “Dig once” “IEEE at the North and South poles,” and “Design for ethics”. Rüdiger observed that ITSoc is less plugged into these IEEE-wide priorities than a number of other societies. A second significant topic at the TAB meeting was a proposed motion to change the distribution of IEEE income to the societies. Currently 10% of IEEE income is distributed evenly across all societies (amounting to roughly \$92k USD each). The balance of income is distributed according to performance metrics wherein click counts play a big role. The proposed motion was to change from the 10%/90% split to having 100% of the distributed be based on performance metrics. The motion was tabled (put aside for future discussion). Rüdiger noted that small societies, which includes ITSoc, benefit more from the 10%/90% formula.

Rüdiger next outlined the ITSoc priorities for 2017. The first priority is to finish the Shannon movie, the second concerns membership, the third branching out technically and in terms of education. In the second two are included (i) the possibility of a new publication (journal or magazine), (ii) a new series of talks, (iii) the development and distribution of short educational videos, (iv) a children’s book on information theory. The target is to have serious discussions of these priorities in the June BoG meeting at ISIT, with votes to follow at the October BoG meeting. Rüdiger noted that, in addition to the initiatives mentioned above, there is \$100k USD left to fund new initiatives. Little of that \$100k is spoken for, so new ideas and proposals would be welcome.

Regarding topics of discussion, Rüdiger noted three. First is the possibility of a new journal. Second concerns the previously observed fact that the impact factor and click rate of the Transactions on Information Theory (the “Transactions”) have slowly been decreasing. We should understand why it is happening, what it means, and whether it can be reversed. One possibility may be because many ITSoc members post to the ArXiv and often use the ArXiv posting for citation purposes, even after the final version of a paper has appeared in the Transactions. Rüdiger hoped that by June we would understand the factors and would have a proposal on what steps to take. The final topic of discussion concerns the presidential model used by the ITSoc. Unlike most societies in the IEEE, the ITSoc president serves for only one year. This means that by the time an individual president has learned what is going on in the IEEE, and who the players are, their term has ended. This makes ITSoc, in some ways, one of the least plugged-in of the IEEE societies. A good fraction of other societies have a two-year presidential term. This isn’t really compatible with the ITSoc “shift-register” model, but it does raise the question of how ITSoc can have a greater impact on the IEEE. One possibility followed by some societies bring is to multiple BoG members, e.g., both the president and vice-president, to IEEE meetings to develop and advocate for a longer-term vision. That might perhaps the easiest thing to do. Rüdiger noted that while each society can bring multiple representatives to meetings, each society does have only a single vote on the TAB, regardless of society size.

- 2) **Treasurer's Report:** Daniela Tuninetti presented the treasurer's report. While the 2016 ITSoc budget targeted a surplus of \$61k USD, as of November 2016 (the most recent numbers we have from the IEEE) the budget is in the negative by about \$28k USD. That said, \$100k USD was spent on new initiatives in 2016 which means that, operationally, ITSoc is "in the black". Final number for 2016 will be received from the IEEE in March 2017.

Regarding the 2017 budget we requested \$140k USD from our reserves (under the "3% rule") for new initiatives. IEEE approved \$105k USD. Generally these resources are intended to continue the broad outreach of the 2016 Shannon Centennial. Specific allocations need to be determined, proposals are welcomed. Overall, in 2017 ITSoc expenses are projected to be higher than income by \$94k USD. However, once the \$105k USD of reserve spending is accounted for, ITSoc will still be "in the black", operationally, which is important so as not to be "black-listed" by the IEEE. There is also the "50% rule" through which ITSoc can spend 50% of the previous year's surplus on new initiatives. The amount of funds available through this mechanism will become clear when IEEE reports the final numbers for 2016.

Daniela then reviewed the current membership and publication offerings. Any possible changes in membership dues or subscription rates need to be proposed by mid-April 2017. While dues and subscription rates have not increased for a long time (other than to receive print copies of the Transactions), overall dues and subscriptions amount to 3-4% of ITSoc revenue, and Daniela proposed to keep everything as is. There was a discussion about the cost of student membership, currently about \$15 USD per year. This is in line with related societies such as the Communications and Signal Processing Societies.

- 3) **Nominations and Appointment Committees:** Michelle Effros first reviewed the membership of the various 2017 ITSoc Committees, announcing new members and reminding committee chairs of the few positions that remain open and need to be filled. Michelle then reviewed the bylaws and constitution committee. The role of this committee is to identify aspects of the constitution and bylaws that need clarification and/or revision, or are out of synch with the IEEE. Proposed changes will be presented for discussion at the ISIT BoG meeting. Finalized proposals need to be distributed a few weeks prior to the formal vote, which is scheduled for the fall BoG meeting. Michelle mentioned two items the BoG will hear about at ISIT. The first has to do with language on diversity (technical / regional / under-represented groups) and ensuring broad representation. The second has to do with the recent change in the length of eligibility for the ITSoc Paper Award. In particular, the window of paper eligibility was extended last year from two years to three, but some parts of the Bylaws were not updated to reflect this change. In general, Michelle asked all committee chairs and members to keep an eye out for needed changes and to send proposed changes to Michelle.

Michelle then introduced a motion to allow Emanuele Viterbo to finish his term as Conference Committee Chair. The Bylaws (Article III, Section 2) dictate that no member of the BoG can serve continuously for more than six years unless in the presidential chain. There was a discussion of how when ex-officio BoG membership was extended to the Conference Committee Chair because of the importance of the position, this possible conflict with the bylaw had not been anticipated.

Motion: "To allow Emanuele Viterbo to finish his term as Chair of the Conference Committee, and hence voting member of the BoG, despite Article III, Section 2." The motion was seconded by Vince Poor. All votes were in favor with one abstention.

- 4) **Shannon Documentary:** Rüdiger next introduce Mark Levinson, director of the Shannon Documentary, who joined the BoG meeting by conference call. Mark talked the BoG through a key aspect of the documentary, an imaginary interview with Shannon at the Shannon Family House in Winchester Massachusetts. This was a five-day shoot that took place in the few weeks just prior to the BoG meeting. Many of the props for the shoot were lent by the MIT museum and by Andrew Shannon. John Hutton played Shannon and wowed the crew and the Shannon family with his resemblance to Claude Shannon both physically and in his manner. Peggy Shannon commented that she really felt like she was watching her father being interviewed. This mock interview will serve as the core of the film, taking up about half the run length. The team has also conducted about a dozen interviews and is now in editing mode. A full-time editor is working on assembling the film.

There was a discussion of time-lines. The shoot took place on-time with no overtime. Most filming is now complete. While there are some small scenes left to be shot, e.g., a flash-back of a young Shannon, there is no dialog in these scenes and so they will be much less work. The final piece is graphics and animation. Mark is working with a pair of designers on this. Mark would love to have most of the film together by the fall. If things run smoothly that's possible. Initial pieces should start coming together in the next month.

- 5) **Conference Committee:** Emanuele Viterbo started by thanking retiring members of the Conference Committee: Jeff Andrews, Stephen Hanly, and Alon Orlitsky. Emanuele then reviewed the current composition of the committee.

Motion: "The Conference Committee Chair requests the approval of Alfonso Martinez as a new member of the Conference Committee." The motion passed with one abstention.

Following the motion there was a discussion about making the appointments in the future to increase geographic diversity. It was commented that it would also be useful to recruit members of recent ISIT organizing committees.

Emanuele then reviewed recent and upcoming ITSoc conferences. ISIT Barcelona still closing and currently estimates a surplus of 34K Euros. Budgets for ISIT 2017, 2018, and 2019 were approved by email in the fall. There was nothing to discuss regarding ISIT 2020 or 2021. Regarding ITWs, ITW 2016 Cambridge U.K. is closing with a 6% anticipated, ITW 2017 Kaohsiung Taiwan is on track. There are two proposals to consider: for 2018 in Guangzhou, China, and for 2018 or 2019 in Northern Italy, the venue is yet to be decided.

Krishna Narayanan presented the proposal for ITW 2018 in Guangzhou on behalf of the organizers. The proposed date is the last week of November, one week prior to the Turbo Coding Symposium scheduled to be held nearby in Hong Kong. The Chinese arm of the ITSoc was founded in 1962, has had yearly national conferences since (other than a break in the 1980s), and has about 200 members. ITW 2018 would take place near Sun Yat-sen University, would be four days in length with two parallel sessions and one keynote per day. There will be 130 papers, and roughly 160 attendees are expected with 50 from mainland China. The BoG reviewed the budget, drew comparison to other ITWs, and provided feedback.

Motion: "The conference committee recommends to approve the proposal for ITW 2018 in Guangzhou." The motion was approved unanimously.

Emanuele next presented a proposal to hold an ITW in northern Italy in early September 2018. Three venues have been considered: Venice (registration of 650 Euro), Como (registration 580-500 Euros), and Milan (registration of 580-600 Euros); pros and cons of

each were presented. The BoG provided feedback on the proposal, leaving the choice of the location to the organizers based on their further budget analyses.

There was a discussion about how developments in US border entry rules might impact attendance at ITSoc conferences, both inside and outside of the United States, and our professional society.

Emanuele then discussed a number of candidate conferences for technical co-sponsorship (TCS): Systems, Communications and Coding (SCC 2017), to be held February 6-9, 2017 in Hamburg, Germany; the Int. Symp. on Inf. Theory and its Applications (ISITA 2018), to be held October 28-31, 2018 in Singapore; the Annual Conf. on Inf. Sciences and Systems (CISS 2018), to be held March 21-23, 2018 in Princeton, N.J. After discussion the following motion was made.

Motion: “The conference committee recommends BoG approval of the technical co-sponsorship for SSC 2017, ISITA 2018, and CISS 2017.” The motion was approved.

Emanuele proposed a change in approval of technical cosponsorship. The general idea is for the BoG to delegate to the Conference Committee the power to approve continuing technical co-sponsorship of conferences, with only periodic review by the BoG.

Motion: “The conference committee proposes to:

- Request BoG vote only for new conferences seeking TCS or when there is not agreement within the Conference committee.
- In all other cases where the conferences have obtained the TCS from the Society in the previous editions (at least two previous editions), the TCS can be approved directly by the Conference committee after verifying the conference has maintained its scope.
- In the latter case, conferences will be brought to the BoG for approval at least every five (5) years.”

The motion passed.

- 6) **Schools Subcommittee:** Aylin Yener next initiated discussed on the schools of information theory. Matthieu Bloch first updated the BoG on the 2017 North American School of Information Theory (NASIT), to be held at Georgia Tech in June. Next, the proposal for the 2018 European School of Information Theory (ESIT) was presented on behalf of the organizers by Alexandre Graell i Amat. The proposal is to hold the school at a fortress in Bertinoro, Italy. He reviewed the facility, the services, noting that all attendees can be hosted at the site. The school would run in early May 2018. There is no overlap with major ITSoc or CommSoc conferences. He reviewed the plenary lecturers.

Motion: “To support 2018 ESIT in Italy in the amount of \$20000 USD.” Motion passed unanimously.

- 7) **Publications:** Prakash Narayan first thanks Frank Kschischang for his work as Editor-in-Chief (EiC) of the Transactions. Prakash then welcomed Sasha Barg on board as Executive Editor (EE) of the Transactions. Prakash reviewed the change in the editorial board of the Transactions with each EE serving for 18 months, and then serving as EiC for another 18 months. Prakash served as EE in 2017. Frank Kschischang stepped down as EiC on 31 December 2016, Prakash started his term as EiC and Sasha as EE on 1 January 2017.

Every five years there is a review of each IEEE Transaction by the IEEE Technical Activities Board (TAB) Periodicals Review and Advisory Committee (PRAC). The objectives are to

entire timeliness and quality, compliance with IEEE policies, and financial health. This is also an opportunity to get suggestions for improvements and best practices. The report to PRAC was submitted on 9 January, the review occurred on 9 February, there will be another round between PRAC and the EiC before the report is archived by the TAB.

An Ad-Hoc Group for the self-examination of the Transactions will be initiated. Members of the group will include the EiC, the EE, the executive editorial board, and the two previous EiCs. The goals of the review are to assess (i) how to attract papers of relevance to a broader community, and (ii) how to increase the impact factor and the number of clicks on IEEEExplore. The group wants to have formulated recommendations by mid-April 2017.

Prakash thanked the retiring Associate Editors (AEs): Salman Avestimehr, Stephan ten Brink, Jun Chen, Sae-Young Chung, Sidharth Jaggi, Tie Liu, Chandra Nair, Haim Permuter, S. Sandeep Pradhan, and Osvaldo Simeone. He next reviewed the current editorial board, which consists of about 48 AEs. Prakash's aim is to boost the number of AEs to about 60, and next introduced a slate of candidate AEs.

Motion: "The BoG is requested to consider a motion to approve the following appointments to the Editorial Board of the IEEE Transactions on Information Theory (see report of the list)." The motion passed unanimously.

Prakash told the BoG that he needs additional AEs in machine learning and in sparse signal processing. This was reflected in the slate of candidates presented. There was a discussion on the distribution of papers by topic, if not measured directly, the slate is driven in part by the current per-AE load. There was a discussion of how the BoG can help the EiC put together a good list of candidates — make suggestions.

- 8) **Shannon Centenary Outreach:** First, Christina Fragouli reviewed outreach efforts conducted as part of the Shannon Centenary. There were somewhere between 35-40 events worldwide. Christina thanked the many ITSoc members who volunteered their time to make these events possible, the Shannon Centennial Committee members who helped supervise and advise these events, and ITSoc Coordinator Matt LaFleur for all his efforts behind the scene. As a Society, support provided included photos, slides, links to videos and articles, a logo, information sheets, and banners. Significant publicity was associated with the Centennial. This included a Google Shannon juggling doodle, articles in paper and online magazines, a stamp in Macedonia, and many event websites. About \$108k USD in total was awarded to assist with these events and to develop the materials for the Centennial.

Next, Matthieu Bloch discussed the pilot videos project. The topics of the first two videos are space-time coding and network coding. These videos have been developed for a target audience of 10th graders and up. The challenge is to explain concepts simply and concisely without using jargon. The first video available on YouTube at <https://www.youtube.com/watch?v=ZpcT7QhXbVs>. The second will be ready soon. Matthieu summed up principles that were learned in the process: identify seminal papers, extract their essence, identify a rough story and develop an outline. Then, iterate to develop a narrative voice over and animations. He summed up the main challenge as being to forget one's expert knowledge and rather to focus on formulating simple analogies. The cost to the Society was \$15k USD per video.

Finally, Anna Scalione presented the children's book. Concepts the book discusses include what is information, what is error correction, and what is network coding. She shared one chapter with the BoG. The current status is that the designer who helped with the Google doodle will put the remaining chapters into the same format as the chapter shared with the

BoG. An open question remains about how to distribute the book, whether through a regular publishing house or through some other channel. Anna confirmed that the budget allocated is sufficient to complete the design of the remaining chapters.

- 9) **Diversity and Inclusion in ITSoc, the IEEE, and in Engineering more widely:** Andrea Goldsmith presented to the BoG on diversity and inclusion in our society, professional organization, and field more widely. She is now chairing the just-created IEEE TAB Committee on Diversity and Inclusion. Andrea first talked about whether things are better now than in the 1980s or 1990s. Currently women make up 12% of the undergraduates in EE, 17% in CS, and 19% in engineering generally. In fact, peak enrollment for women in CS occurred in 1984, at 36%, and has been dropping since. In graduate programs 20% of master's degrees in EE are awarded to women and 14% of PhDs. In term of faculty appointments, 16% of professors in EE and CS are women, with the percentages being below 10% at Stanford and other top engineering schools. Industry isn't doing much better, only 13% of the engineering workforce are women, and more than 50% of these women leave careers in technology. Those departing report that it is not the work/life balance that is causing them to seek other careers, but rather the climate is bad, and deteriorates with seniority due to challenges in climbing the corporate ladder. Fewer than 3% of patent holds are women and only 8% of Bay Area series-A startups had women founders last year. These numbers are low, they are not improving, and they are below critical mass to ignite change. The outlook is even bleaker for under-represented minorities (URMs). This lack of diversity hurts both individuals and organizations. Women and URMs entering the work force are missing out on the possibilities of great careers, and our field is missing out on half the talent pool. Studies show that diverse organizations are more creative, perform better, and deliver higher job satisfaction. Start-ups that are led by women have great track records.

Andrea then provided some statistics to help figure out how the IEEE is doing and to underline why fostering diversity is important to the IEEE. (The IEEE only tracks statistics for women members, and not for URMs or other under-represented groups, so the following data only concerns women members.) First off were membership statistics. While 12% of IEEE members are female, much of that stems from student members: 30% of IEEE undergrad members are women while among graduate student members only 8.8% are women (below the female percentage of graduate students), regular member 8.7%, senior members 7.8%, and among IEEE fellows 4.4% are women. This decline can be interpreted to mean that the IEEE is not providing the same benefit to its female members (and URMs) as to other members. Regarding IEEE awards, the percentage of female winners (and nominees) are in the low single-digits. Indeed, 21 out of 29 mid-career awards have never had a female recipient. Even more tellingly, in 2011-15, 4-6% of the mid-career award nominees and 1-7% of the medal award nominees were women. In 2015 two-thirds of IEEE mid-career awards did not receive a single nomination of a female candidate. In terms of publications and conferences, there is a lack of female editors-in-chief and women are under-represented on editorial boards and in conference organization (as general chairs, TPC chairs, TPC members). Within ITSoc Andrea described the history of female representation, noting that 2004 was a turning point when many initiatives were seeded. Committees were formed such as the Outreach Subcommittee (in 2008) and WITHITS (in 2009). Three female ITSoc presidents have served since 2004 with two more in the pipeline. Although until 2009 no women had been elevated to IEEE fellows through ITSoc, several have been elevated through the society in the last few years. In addition, Katalin Marton won the Shannon Award, women have been awardees of the joint ITSoc-CommSoc paper twice, and women are now represented on the awards committee.

After setting this picture, Andrea discussed effective strategies to “move the needle”. In fact, the IEEE recognizes it has a problem. Jose Moura (chair of TAB board) asked Andrea to co-chair an ad-hoc committee on Women and Under-represented Groups (WUG) in 2016. The Committee delivered its final report in November 2016, the top recommendation of which was to form the just-approved standing committee mentioned above, with sufficient resources and power to implement its recommendations. Other recommendations include: (ii) require data collection and track metrics on female and URM members by all societies and IEEE activities, set targets, and track progress; (iii) build a repository for society best practices on diversity/inclusion, and incorporate questions about these activities into societal reviews, (iv) training for IEEE/society/committee leadership and staff addressing diversity, inclusion, and best practices, include implicit bias training; (v) create a briefing on implicit bias to raise awareness within the IEEE and beyond beyond, similar to Royal Society document on this topic (<https://royalsociety.org/topics-policy/publications/2015/unconscious-bias/>) or the one the IEEE Awards Board now sends to all its awards committee chairs, (vi) make the “face” of the IEEE and its marketing more inclusive, (vii) create IEEE-wide initiatives for URM members, (viii) support the creation of a climate survey for all IEEE members. Looking forward the IEEE can be a role model for the profession, a profession currently struggling to attract and retain diverse members.

In conclusion Andrea stated that individuals can have a big impact and encouraged all present to think what they can do to help. She stated that, in particular, “we need the guys” to advocate for recognition and representation of women, as they comprise the critical mass needed for change.

10) **New Publications:** Elza Erkip presented an update on the initiatives surrounding new publications. She first reviewed the two ideas in hand. The first is an IT Magazine to replace the Newsletter, to provide a venue for tutorial / vision articles, to be archival, and to increase visibility of IT. The second is a special topics journal. Each issue would be on a focused topic, led by a team of guest editors, would increase exposure for emerging topics in IT, would have a short sub-to-pub time, and would relieve pressure on the Transactions. The next steps are to form an ad-hoc committee chaired by Jeff Andrews and Elza to study feasibility, the financial impact, and to develop a plan with the aim of providing a committee report at the ISIT BoG meeting with voting to follow at the Chicago meeting.

11) **Adjournment:** The meeting adjourned at 5:15pm PST.