IEEE Information Theory Society Newsletter

President's Column

Michelle Effros

Making a case for communication to the community of information theorists may seem unnecessary. Still, I hope that you will indulge me. I think that we should do more. In his 1948 paper, Shannon wrote that "the fundamental problem of communication is that of reproducing at one point... a message selected at another point." While Shannon investigated the act of communication, I want to consider the "points" between which communication occurs, especially communication about information theory.

The IEEE Transactions on Information Theory are the primary medium for communication about information theory. These Transactions are a beacon of technical excellence. They communicate a world of beautiful and technology-changing results to a dedicated and engaged readership steeped in the mathematics needed to derive them. This is their mission. I wonder, though, whether the Transactions' readership is the only "point" to which we ought to communicate. I fear that by focusing the description of our results only on those who can follow their derivation, we are prohibiting new connections, missing avenues of impact, and failing to inspire new generations to similar excellence.

Information theory explores great truths and enables new advances. Our results are applicable beyond our boundaries, but we offer few paths for scientists from other fields to understand them, or even to recognize that there is something there to be understood. Our technological impact is pervasive, but we offer few avenues for the communities whose communication networks and healthcare systems and very economies are changed by those technologies to know of our roles in those advances. And what about our children? Will scientists, mathematicians, and engineers make it to the roster of heroes (today mostly sports figures) that our children dream of becoming if those children never learn of how those people change their lives?

As I noted in the March Newsletter, the Information Theory Society is embarking on an initiative to increase communication about information theory beyond our borders. While these efforts are new, there is already significant progress to report. Led by Christina Fragouli, Ruediger Urbanke, and Sergio Verdú, an ad hoc committee tasked with thinking broadly about outreach is planning public celebrations of Shannon's centenary and exploring the possibility of a documentary to celebrate Shannon's life and work. If you have materials relevant to the Shannon celebrations, would consider hosting such a celebration at your institution, or just want to get involved, the committee would be glad to hear from you. Daniela Tuninetti, our society treasurer, is also playing a critical role in tackling the financial questions and possible fundraising efforts needed to finance a major outreach effort of this kind. If you have suggestions or connections that might be useful for funding a documentary or other outreach activities, please get in touch with her. Under the leadership of Elza Erkip, the Conference Committee is exploring current venues and future possibilities to bring information theorists together with the researchers in other disciplines. Joint workshops on topics as diverse as molecular, biological and multiscale communications, genomics, neuroscience, and finance are currently under discussion. If you have further suggestions or want to get involved, they would love to hear from you. Our Newsletter Editor, Michael Langberg, is working to identify researchers from other fields who use information theory in their work and to invite them to describe their problems and perspectives in the Newsletter. Articles on fields such as combinatorics and machine learning are likely first candidates in this initiative. If you have ideas of research areas where you believe there should be productive connections or thoughts

From the Editor

Michael Langberg

Dear colleagues,

This is my first issue as editor of the IT Society Newsletter. I am very glad to have the opportunity to take on this responsibility, and in such, to serve our scientific community. I thank the IT society president Michelle Effros and the Board of Governors for entrusting me with this role. Please join me in thanking the outgoing newsletter editor Tara Javidi for her work and devotion over the past three years, and congratulating her on an outstanding job!

The June issue opens with the President's Column which focuses on the needs, possibilities, and recent actions of our community in its thrust to reach out and influence societies beyond our own. Several new and exciting outreach initiatives are outlined. I join our society President Michelle Effros in her appreciation for the significant efforts made in these challenging initiatives, and in her call for our readers' ideas, thoughts, and contributions.

In the body of this issue you will find our outstanding consistent contributors Tony Ephremides and Sol Golomb with their popular columns alongside a number of reports on recent events and initiatives. Antonio Campello has kindly prepared a report on the two-week school on Information Theory (SPCodingSchool) that took place in São Paulo, Brazil this January. Following the theme of ``outreach'', Urbashi Mitra has prepared an introduction of the new "IEEE Transactions on Molecular, Biological and Multiscale Communications" (TMBMC) for our readers. The TMBMC is a new journal which focuses on topics that lie between communication, sensing and control in the context of biological systems. Our readers are encouraged to consider contributions. Finally, a report is given on a recent BIRS workshop "Between Shannon and Hamming: Network Information Theory and Combinatorics" which gathered researchers from different communities interested in the fundamental theoretical properties of network communication. I hope you will find this issue informative and enjoyable!

Please help make the newsletter as interesting and informative as possible by sharing ideas, initiatives, or potential newsletter contributions you may have in mind. I am in the process of searching for contributions outside our community, which may introduce our readers to new and exciting problems and, in such, broaden the influence of our society. Any ideas along this line will also be very welcome.

Announcements, news and events intended for both the printed newsletter and the IT Society website, such as award announcements, calls for nominations and

IEEE Information Theory Society Newsletter

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SPCodingSchool: An International School of Information and Coding Theory

Antonio Campello

The São Paulo Advanced School on Information Theory (SPCodingSchool) took place at University of Campinas, São Paulo, Brazil. It was a two-week school (from Jan 19 to Jan 30) attended by 123 graduate students from 71 universities spread all over the world. The students' geographical diversity gave the school a real international flavor, while the innovative two-week format helped the participants interact more deeply, establishing academic and lifetime acquaintances.

The program was divided in two parts: the first week consisted of introductory courses on various topics intended for students with different backgrounds (mostly EE, Mathematics and CS). During the second week, more advanced courses were conducted by professors from abroad. The range of topics covered by the courses was very broad, from basic error-correcting codes, Information Theory, lattices and network coding to wireless networks, codes for storage, physical-layer security, chip-to-chip communication, Gaussian broadcast channels and spatial coupling. Most of the slides of the courses are available in the school forum (www.ime.unicamp.br/spcodingschool/forum), and the videos of the lectures can be watched online (http://www.ime.unicamp.br/spcodingschool/courses.html). Everyday, 12 students presented their research in a small quantity-high density poster session distributed over 10 days.

The success of the scientific program was due to the students commitment and the excellence of the lecturers: the introductory courses were given by professors Danilo Silva (Federal University of Santa Catarina), Max Costa (University of Campinas), Ninoslav Marina (Haute Ecole ARC), Paulo Barreto (University of São Paulo), Reginaldo Palazzo (University of Campinas), Sueli Costa (University of Campinas), and Valdemar da Rocha Jr. (Federal University of Pernambuco). The advanced courses were given by professors Alex Sprintson (Texas A&M), Alexander Barg (University of Maryland), Amin Shokrollahi (EPFL and Kandou Bus), Chandra Nair (Chinese Univeristy of Hong Kong), Henk Van Tilborg (Eindhoven University of Technology), Jean-Claude Belfiore (Télécom-ParisTech), João Barros (Universidade do Porto) Michelle Effros (Caltech), and Rüdiger Urbanke (EPFL).

In the second week, Prof. Vinay Vaishampayan (City University of New York) chaired a special panel session entitled "Information Theory, Coding Theory and the Real World", where 8 panelists shared their experience in trying to apply fundamental research outside academia. Also in the second week, there was a special session regarding the rebirth of the Brazilian Chapter of the ITSociety, supported by ITSOC president Michelle Effros. The chapter president is Sueli Costa (University of Campinas).

The majority of the students approved the two-week long format, according to an evaluation form filled at the end of the school. When asked about the best aspect of the school, students diverged on the social and scientific sides. "The best aspect for me was social networking", answered one of them. "The lectures were definitely the best part", answered a second student. Discussions and scientific collaboration among the students and professors could be seen everyday in the conference venue. The unprecedented friendly environment was evident during the whole school, specially in the social events (two *real* Brazilian barbecues).

The School was chaired by Marcelo Firer and co-chaired by Cristiano Torezzan (both from University of Campinas). The generous support from The São Paulo Research Foundation (FAPESP) covered the travel and accommodation expenses of virtually all the participants. We cannot resist finishing this report with a testimony from the evaluation form of one of the participants: "Very good job, the best workshop I have ever attended to date".
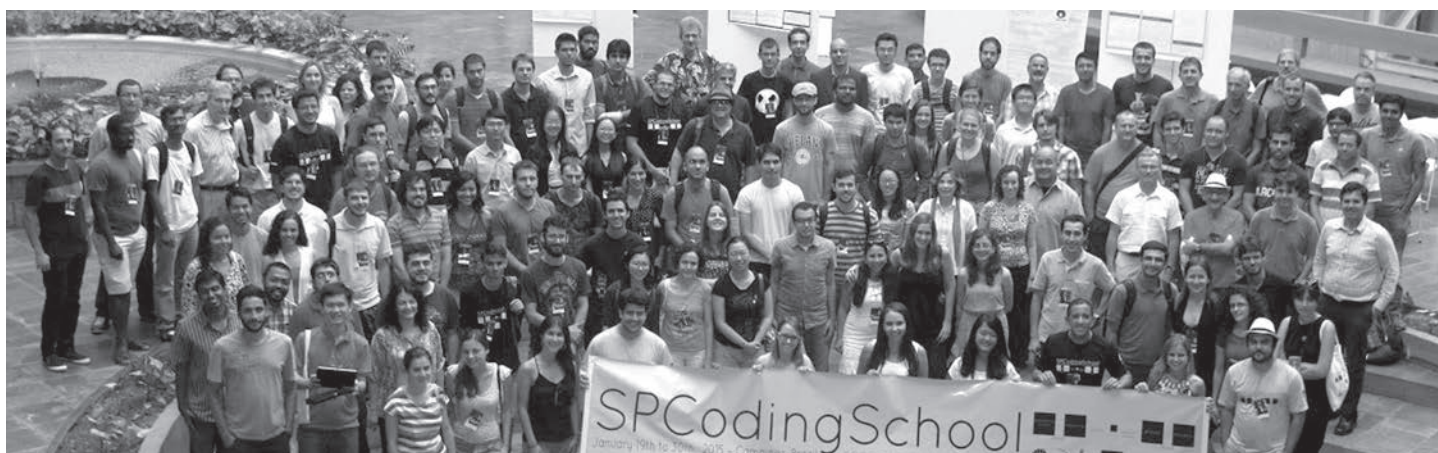
BIRS Workshop: Between Shannon and Hamming: Network Information Theory and Combinatorics

Michael Langberg on behalf of the workshop organizers

The Banff International Research Station (BIRS) is a facility in Banff, Canada that supports workshops on collaborative and cross-disciplinary research with a focus on the mathematical sciences. The workshops typically span an entire week and are located in the beautiful and peaceful mountain setting of Banff. The workshop facilities, including accommodation and board allow for uninterrupted research activities. In what follows, please find a brief report on one of the several information theory themed workshops organized by BIRS recently.

With the objective of bringing researchers from different communities to a joint gathering focusing on the topic of network communication, the BIRS workshop "Between Shannon and Hamming: Network Information Theory and Combinatorics" took place during the week of March 1, 2015. The workshop was organized by Michelle Effros, Sid Jaggi, Frank Kschischang and Michael Langberg; and included 27 participants from the fields of network information theory, network coding, combinatorics, coding theory,

and communications. Participants gave lectures on recent "cutting edge" research alongside tutorials on broad research areas. The research activities spanned several formats including early morning hikes, "standard" lectures, meetings in small groups, open problem sessions, and evening discussions. The topics discussed followed the broad theme of network communication and included: the analysis of adversarial error models that lie between the random memoryless noise model of Shannon and the worst-case error model of Hamming, topics in Network Coding and in particular Index Coding, combinatorial aspects of communication, reductive arguments in the context of network communication, secure and reliable communication, and topics in distributed storage. The workshop was a great success, and hopefully will trigger future workshops of this nature.

The organizers would like to take this opportunity to thank the BIRS center and its staff for supporting this very fruitful and stimulating meeting.

The New *IEEE Transactions on Molecular, Biological and Multiscale Communications (TMBMC)*

Urbashi Mitra

I would like to introduce the new *IEEE Transactions on Molecular, Biological and Multiscale Communications (TMBMC)* to the Information Theory community. As a result of recent advances in MEMS/NEMS and systems biology, as well as the emergence of synthetic bacteria and lab/process-on-a-chip techniques, it is now possible to design chemical "circuits", custom organisms, micro/nanoscale swarms of devices, and a host of other new systems at small length scales, and across multiple scales (e.g., micro to macro). This success opens up a new frontier for interdisciplinary signaling techniques using chem-

istry, biology, novel electron transfer, and other principles not previously examined. This journal is devoted to the principles, design, and analysis of signaling and information systems for these novel applications. Thus molecular communication as well as chemical and biological (and biologically-inspired) techniques; and new signaling methods at different scales are of interest.

As the boundaries between communication, sensing and control are blurred in these novel signaling systems, thus, research

contributions in a variety of areas are invited. In particular, theoretical results grounded in information theory, communications and networking are of high interest. Data-starved or data-rich statistical analyses of biological systems are relevant. Experimental results on information processes or networks in biology are also within our scope.

The new journal was seeded by special issues within the IEEE Journal on Selected Areas of Communications. The second special issue will serve as the inaugural issue of the journal with publication Fall 2015. In particular, I highlight four papers from the first special issue (December 2014) that suggest models and investigate capacity for these biological systems:, "Capacity of the Memoryless Additive Inverse Gaussian Noise Channel," by Hui

Li, Stefan Moser and Dongning Guo; "A Unifying Model for External Noise Sources and ISI in Diffusive Molecular Communication," by Adam Noel, Karen Cheung and Robert Schober; "Channel and Noise Models for Nonlinear Molecular Communication Systems," by Nariman Farsad, Na-Rae Kim, Andrew Eckford and Chan-Byoung Chae, and "A Stochastic Model for Electron Transfer in Bacterial Cables" by Nicolo Michelusi, Sahand Pirbadian, Urbashi Mitra and Mohamed El-Naggar.

I believe that information theory has much to offer in terms of fundamental analysis of biological and molecular communication systems. I invite, and look forward to, the contributions from our members to our new journal. Please submit your original work to TMBMC at: https://mc.manuscriptcentral.com/tmbmc

The Historian's Column

Anthony Ephremides

In my last column I wrote about the circumstances that surrounded the lives and careers of three German members of our community who were caught in the turmoil caused by the Nazi regime through which, and after which, they led their lives. It showed how complex and how unpredictable human nature can be. Taking off from that I thought it would be interesting to ruminate on ethical and law- abiding aspects of the lives of our colleagues. After all there are over 300,000 members in IEEE and over 5,000 members in our Society. So, it is reasonable to expect that collectively we form a sample of Society which is, admittedly, somewhat biased but not uncorrelated with a typical such sample.

So, indeed, there are numerous ways in which we notice behavior in our ranks which is often, well ..., imperfect and, sometimes errant and, even, unethical or illegal. Obviously I am not prepared to mention names or to level arbitrary or untrue accusations. But, in a recent discussion with colleagues, we were cataloguing instances of actions that fitted these categories and that were, in some cases, even amusing.

Let us start with minor infractions. We all know that when conference paper submission deadlines are approaching and the numbers of papers submitted lag significantly, many of us will announce that "due to repeated requests" we are extending the deadline. This is an innocent, white lie that serves a purpose (we think) even though we all know its true reason. A little less innocent than that are actions from the "other side". That is when the deadline is looming, some individuals send multiple messages through phony aliases (from unverifiable "gmail" accounts) that pretend to show an avalanche of true desperate requests from the "grassroots." In one case, I recall, the sender did not even bother to change the wording of the request. So we ended up receiving over 20 requests from 20 different addresses with identical content requesting extension.

Moving on to more serious infractions on a topic we are all intimately (and, often, painfully) familiar with, let us consider the issue of paper reviews. It is a common secret that the quality of

the reviews, on average, has diminished significantly. Partly because of overload and sheer numbers, and partly because of carelessness or intent, some reviews are unfair, vague, incorrect, or outright amusingly hostile. The occasional diligent reviews that are still (thankfully) present (especially in the journal and conferences of the IT Society) are the exceptions that confirm the rule. Once I recall a review that suggested rejection of one of my papers because it contained "no counter-intuitive results". Another one suggested rejection because there were numerous terms undefined, like, "Multiple Access", "M/M/1", "Collisions", "Interacting Queues" etc. Come on! This was not a paper submitted to Vogue magazine! And lest anyone thinks that this was in our Transactions, let me dispel this thought. Both examples were from some of the numerous journals of our "sister" Communications Society. And yet, the responsible editors/TPC chairs often write that they also read the paper and they fully concur with the reviews!

There have been even more targeted and vindictive samples of behavior that often cause serious distress, if not serious career impediments to writers (especially students or junior faculty). And, of course, from the other side there are increasing cases of plagiarism, purposeful omission of references, and, in general, let's call it, "uncouth" behavior (independent parallel submissions, concealment of sources, etc.)

But, still, these are instances of objectionable, perhaps unethical, but not illegal behavior. This is the real world and we must be prepared that we shall encounter such actions and attitudes. Unfortunately, the real world shows even its uglier face in our community. There have been several documented instances of illegal behavior that have led to dismissals, convictions, jail terms, and, at least indirectly, to death. Yes, it is sadly true.

First we have had cases of mishandling financial transactions related to travel reimbursement or budget manipulations. A person

traveling repeatedly to meet a "friend" was claiming trips for "research collaboration". Another case involved purchasing with NSF funds equipment that was not justified by the scope of the grant and that was further used for illicit purposes. Then there was an individual who acted as a reviewer and revealed himself to the authors asking them to include him as co-author in order to recommend acceptance of the paper. Or there was another person who was actually associate editor in a journal and proposed to another associate editor to "accept" each-other's papers! And there was yet another case of a department chair who withheld many applications for a position from his faculty so as to make sure only his favorite candidate would be considered. And of course there have been several cases of sexual nature where inappropriate use of rank and position was made to ensure sexual favors. Obviously, I cannot reveal details and names but all these cases (and …more) are unfortunately true.

To cap it all, there was a case of a rather talented faculty member who became paranoid about his Dean conspiring to harm him in different ways and, as a result, he decided to threaten his life, stalked his house while armed (even firing shots at the house) and eventually was arrested, jailed, and eventually passed away in prison.

Let me conclude with a couple of comments. All these incidents (and, I am sure, then some) in no way represent what is typical in our Society. They are simply instances of the diversity of human character and behavior. They are present and occur in all walks of life. Any similarity to cases you may know is purely coincidental. As, Sergio Verdu had noted, tongue-in-cheek, during our discussion, there are IEEE Fellows and, then, there are IEEE Felons!

Pentominoes Challenges

Solomon W. Golomb

We recall that the twelve PENTOMINO figures are;
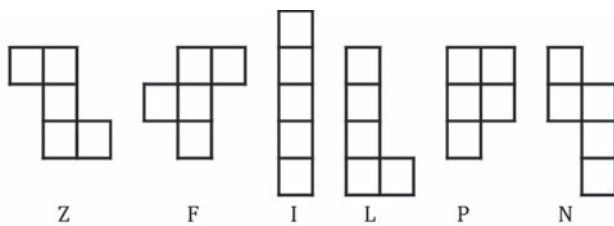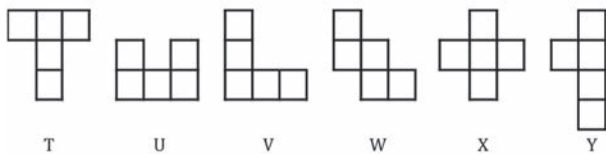
each composed of five unit squares. Here are some challenging tasks to do with them. (Each piece can be rotated and reflected – i.e. flipped over at will.)

1) Arrange the twelve pentominoes into one 3×20 rectangle.

2) Arrange the twelve pentominoes into two 5×6 rectangles.

3) Find a simply-connected region of twenty squares, where three copies of this region can hold all twelve pentominoes.

4) Fit the twelve pentominoes into three 3×7 rectangles, where each rectangle will have one empty square.

5) Fit nine of the twelve pentominoes into three 4×4 squares, where each 4×4 square will have one empty 1×1 square.

6) Place the four pentominoes F, P, T, U onto a 7×7 "board" in such a way that none of the other eight pentominoes can fit on the board. (We require pentominoes to cover five squares each of the 7×7 grid.)

7) Place the five pentominoes I, L, P, V, Z onto an 8×8 "board" in such a way that none of the other seven pentominoes can fit on the board. (We require pentominoes to cover five squares each of the 8×8 grid.)

Note. The easiest of these is no. 5, which has multiple solutions. The others have solutions that are unique, or nearly so. The last two are the hardest.

President's Column

on individuals who might be good candidates to write such pieces, please send your suggestions to the Newsletter editor. The creative talents and boundless energy of the information theory community have long been an inspiration to me. I hope that you will lend some of those talents and energies to the endeavor of communicating the beauty and impact of information theory beyond the boundaries of our field. I would love to hear how you plan to get involved. Please write to me at effros@caltech.edu.

GOLOMB'S PUZZLE COLUMN™

Fallacious Proofs Solutions

Solomon W. Golomb

1) The fallacy in the proof that $1 + 2 + 4 + 8 + \ldots = \sum_{n=0}^{\infty} 2^n = -1$

   is that it assumed that there *was* a (finite) sum S. An infinite value of S also satisfies $S - 1 = 2S$. (In "dyadic arithmetic", since the *finite* sum $\sum_{n=0}^{k} 2^n = 2^{k+1} - 1$, in the non-Archimedian system, 2^k gets closer and closer to 0 as k increases, so in this limit the infinite sum *is* equal to –1.)

   Counter-Example: $\sum_{n=0}^{\infty} 2^n > 2^N$ for every positive integer N, so it cannot equal –1.

2) If A and B are both (symmetric) $n \times n$ matrices, the transpose of the product, $(AB)^T$ is *not* $A^T B^T$, but $B^T A^T$. Thus, if $A^T = A$ and $B^T = B$, then $(AB)^T = B^T A^T = BA$, and $BA \neq AB$ unless the matrices A and B commute.

   Counter-Example: Let $A = \begin{pmatrix} 1 & 2 \\ 2 & 3 \end{pmatrix}, B = \begin{pmatrix} 2 & 1 \\ 1 & 0 \end{pmatrix}$ both symmetric.

   Then $AB = \begin{pmatrix} 1 & 2 \\ 2 & 3 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 0 \end{pmatrix} = \begin{pmatrix} 4 & 1 \\ 7 & 2 \end{pmatrix}$, *not* symmetric.

3) The "proof " that a trisectible angle is constructible was circular. It assumed we had θ to begin with, and then ended up constructing θ. It did not construct θ from scratch.

   Counter-Example: The only angle θ we will use that is known not to be constructible in $\phi = 2\pi/7$, the "central angle" of a regular heptagon, a famous non-constructible figure. We will take $\theta = 6\pi/7$. The supplement of this angle, $\pi - \frac{6\pi}{7}$, equals $\pi/7$ so *given* θ, we can obtain $\pi/7$, and then $2(\pi/7) = \frac{1}{3}\theta$, so θ (when *given*) is trisectible, although θ is not (ab initio) constructible. $\square$

4) The problem with the "proof " that *symmetric* ($R(a, b)$ true implies $R(b, a)$ true) and *transitive* (both $R(a, b)$ true and $R(b, c)$ true imply $R(a, c)$) true prove *reflexive* $R(a, a)$ true, is

that the reflexive property requires $R(a, a)$ to be true *for all a∈S*, and the "proof " only works if there exists $b∈S$ that makes $R(a, b)$ true. If $R(a, b)$ is *never* true, for some a, the reflexive property fails.

Counter-Example: Let S be the set of positive integers, and let $R(a, b) = \min (a, b) > 100$. This statement says that a and b each exceed 100. It is symmetric and transitive but fails to be reflexive for each $a = b \leq 100$.

Note. I have seen the four false statements above either asserted as true, or assumed to be true, in serious articles. The remaining two false statements suffer from the same basic flaw. Since the conclusions are obviously false, most students asked to spot the fallacy in the proof mistakenly attack the inductive hypothesis itself.

5) The problem with the "proof " by Mathematical Induction that "all crayons are the same color" is that $k = 2$ does not follow for $k = 1$. If we have only $k = 1$ crayon, and then add a second crayon but remove the first, the "new" crayon has nothing to agree with.

   Counter-Example: Look at a box of crayons.

6) The problem with the "proof" by Mathematical Induction that n lines in the plane, no two of which are parallel, must all have a common point, is that $k = 3$ does not follow from $k = 2$. It is true that 2 non-parallel lines in the plane will meet at a point P, but when we introduce a 3rd line and remove one of the original two, the "new" line need not pass through the point P.

   Counter-Example: With $n = 3$ lines in the plane, no two of them parallel, we can have

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From the Editor *continued from page 2*

Call for Papers

2016 International Zurich Seminar on Communications

March 2 – 4, 2016

The 2016 International Zurich Seminar on Communications will be held at the Hotel Zürichberg in Zurich, Switzerland, from Wednesday, March 2, through Friday, March 4, 2016.

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

Wireless Communications	Optical Communications
Information Theory	Fundamental Hardware Issues
Coding Theory and its Applications	Network Algorithms and Protocols
Detection and Estimation	Network Information Theory and Coding
MIMO Communications	Cryptography and Data Security

Invited speakers will account for roughly half 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.

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 deadline for submission is **September 27, 2015**.

Additional information will be posted at

    http://www.izs.ethz.ch/

We look forward to seeing you at IZS.

Amos Lapidoth and Stefan M. Moser, Co-Chairs.

Joint Telematics Group (JTG)
and IEEE Information Theory Society Presents

The 7th Summer School on
Signal Processing, Communications, and Networks
Indian Institute of Science, Bangalore
July 20-23, 2015

Speakers

Yihong Wu

Assistant Professor

University of Illinois, Urbana-Champaign

Topic: Information-Theoretic Methods in High-Dimensional Statistics

Gerhard Kramer

Professor

Technische Universität München (TUM).

Topic: Multi-Terminal Communication Theory

Dates and Venue

20-23 July 2015, ECE Department, Indian Institute of Science, Bangalore.

Registration

- Registration opens on March 16, 2015.
- Space is limited (to 110 registrants). Apply early.

For more information

http://www.ece.iisc.ernet.in/~jtg/2015/

Organising and sponsoring institutions

Joint Telematics Group
IEEE Information Theory Society
Indian Institute of Science
Council of Scientific and Industrial Research, India

Eighth Annual North American
School of Information Theory

Monday–Thursday, August 10–13, 2015
UC San Diego, La Jolla, California

The School of Information Theory will bring together over 100 graduate students, postdoctoral scholars, and leading researchers for four action-packed days of learning, stimulating discussions, professional networking and fun activities, all on the beautiful campus of the University of California, San Diego (UCSD) and in the nearby beach town of La Jolla.

Program overview

- Tutorials by some of the best known researchers in information theory and related fields
- Poster presentations by student participants with feedback and discussion
- Panel discussion on "IT: Academia vs. Industry Perspectives"
- Social events and fun activities

Confirmed speakers

- Stephen Boyd, Stanford
- Venkatesan Guruswami, CMU
- Syed Jafar, UC Irvine
- Urbashi Mitra, USC

Organizing committee

- Massimo Franceschetti, UCSD
- Tara Javidi, UCSD
- Young-Han Kim, UCSD
- Victoria Kostina, Caltech
- Alon Orlitsky, UCSD
- Paul Siegel, UCSD
- Alexander Vardy, UCSD

Advisors

- Gerhard Kramer, TU Munich
- Ramesh Rao, UCSD
- Aylin Yener, Penn State University

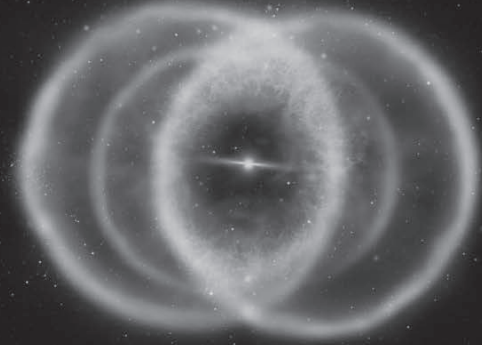**Registration:** $100 (covers shared room, full board, and lectures for all four days)

Application deadline: Monday, May 11, 2015 (http://ita.ucsd.edu/nasit2015)

Nexus of Information and Computation Theories

Institut Henri Poincaré
Spring 2016 Thematic Program
http://csnexus.info

January 25 - April 1, 2016
Paris, France

About the Program

Recently, a number of advances in the theory of computation have been made by using information-theoretic arguments. Conversely, some of the most exciting ongoing work in information theory has focused on problems with a computational component. The primary goal of this three-month IHP thematic program is to explore the rich interplay between information theory and the theory of computation, and ultimately create new connections and collaborations between both scientific communities.

- **Core of the Program:** eight weeks, split across four major themes (see below for details).
- **Central Workshop (February 29 - March 4):** broadly spanning the interface between CS and IT.
- **Tutorial Week (January 25 - 29) at CIRM (Marseille):** designed for students, but all are welcome.

Registration

Researchers and students who are considering attending any part of the program **must register on the website as soon as possible.** Registration is free but mandatory given the limited number of places. During the registration process, one can choose amongst the thematic weeks and/or the central workshop.

Program Organizers

Mark Braverman (Princeton)
Bobak Nazer (Boston University)
Anup Rao (University of Washington)
Aslan Tchamkerten (Telecom Paristech)

About IHP

The Henri Poincare Institute (IHP) is a research institute dedicated to mathematics and theoretical physics. Each quarter, the institute hosts a thematic program that brings together researchers from a particular discipline to foster the exchange of ideas.

Theme Organizers

Distributed Computation (February 1 - 12)
Péter Gàcs (Boston Univeristy)
János Körner (Sapienza University of Rome)
Leonard Schulman (Caltech)

Fundamental Inequalities (February 15 - 26)
Kasper Green Larsen (Aarhus University)
Babak Hassibi (Caltech)
Iordanis Kerenidis (University Paris Diderot 7)
Raymond Yeung (Chinese University of Hong Kong)

Inference Problems (March 7 - 18)
Amit Chakrabarty (Dartmouth College)
Andrew McGregor (UMass Amherst)
Henry Pfister (Duke University)
Devavrat Shah (MIT)
David Woodruff (IBM)

Secrecy and Privacy (March 21 - April 1)
Prakash Narayan (University of Maryland)
Aaron Roth (University of Pennsylvania)
Anand Sarwate (Rutgers University)
Vinod Vaikuntanathan (MIT)
Salil Vadhan (Harvard University)

Conference Calendar

DATE	CONFERENCE	LOCATION	WEB PAGE	DUE DATE
June 8–12, 2015	**IEEE International Conference on Communications (ICC 2015)**	London, United Kingdom	http://icc2015.ieee-icc.org/	Passed
June 8–12, 2015	**2015 Hong Kong Croucher Summer Course in Information Theory**	Hong Kong	http://www.ie.cuhk.edu.hk/Croucher-summer-course-in-IT-2015	—
June 14–19, 2015	**2015 IEEE International Symposium on Information Theory (ISIT 2015)**	Hong Kong	http://www.isit2015.org/	Passed
June 22–24, 2015	**International Symposium on Network Coding (NetCod 2015)**	Sydney, Australia	http://www.netcod2015.org	Passed
June 28–July 1, 2015	**The 16th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)**	Stockholm, Sweden	http://www.spawc2015.org/	Passed
July 20–23, 2015	**Joint Telematics Group/IEEE Information Theory Society Summer School on Signal Processing, Communications and Networks.**	IISc Bangalore	http://www.ece.iisc.ernet.in/~jtg/2015/jtg2015/index.html	—
September 29–October 2, 2015	**53rd Annual Allerton Conference on Communication, Control, and Computing.**	Allerton Retreat Center, Monticello, Illinois, USA	http://allerton.csl.illinois.edu	TBA
October 11–15, 2015	**IEEE Information Theory Workshop (ITW 2015).**	Jeju Island, Korea	http://www.itw2015.org	Passed
October 18–20, 2015	**56th Annual IEEE Symposium on Foundations of Computer Science (FOCS 2015).**	Berkeley, California, USA	http://www.cs.cmu.edu/~venkatg/FOCS-2015-cfp.html	Passed
December 6–10, 2015	**IEEE GLOBECOM.**	San Diego, California, USA	http://globecom2015.ieee-globecom.org	Passed
December 14–16, 2015	**IEEE Global Conference on Signal and Information Processing (GlobalSIP).**	Orlando, Florida, USA	http://2015.ieeeglobalsip.org	Passed
March 2–4, 2016	**2016 International Zurich Seminar on Communications.**	Zurich, Switzerland	http://www.izs.ethz.ch	September 27, 2015
January 25–April 1, 2016	**IHP Thematic Program on the Nexus of Information and Computation Theories.**	Paris, France	http://csnexus.info	—

Major COMSOC conferences: http://www.comsoc.org/confs/index.html