

sponsors a growing “mentorship network” and the “

Collegiality (): cooperative interaction among colleagues.

ONE OF the most precious attributes of our Society, and 352 -1xh7 seen examples where the total length of the reviews exceeded

ed that of the paper itself, or where, in light of a particularly

incisive insight, a reviewer was invited to join the paper as co-author. One often reads, in papers published in our Transactions, acknowledgments to the anonymous reviewers for their helpful comments. We should all strive to see that this tradition continues.

Another great example of our spirit of collegiality and generosity is the support that we show to our “junior” colleagues. The Society’s student committee, led by Aylin Yener, maintains a web site with helpful career information, including pointers to job openings, and the committee has organized numerous successful events including a variety of Research Roundtables and panel discussions at conferences. And, as reported in the previous Newsletter, under the leadership of Aylin and Gerhard Kramer (and with the help of a large cast of volunteers), the Society last year sponsored a highly successful Second Annual North American School of Information Theory.

Initiated by Muriel Médard, and now led by Todd Coleman, the Society’s Outreach committee has organized some very popular panel discussions at conferences and symposia, and

WITHITS” (Women in the Information Theory Society), led by Christina Fragouli. These initiatives will, I believe, help us to perpetuate the spirit of generous collegiality that sets this Society apart.

— ◇ —

Sub-to-Pub (, colloq.): the time between submission and publication of a journal paper.

OF COURSE, it is the high technical quality of the papers published in the IEEE T

From the Editor

Tracey Ho

Dear IT Society members,

I hope you have had a productive start to 2010! Among the articles in this issue, we have Frank Kschischang's first column as IT Society President, where one of the issues discussed is the lengthy "sub-to-pub" time of the IT Transactions. This concern is also addressed in the set of recommended editorial practices recently put together by IT Transactions Editor-in-Chief Ezio Biglieri, which is included in this issue to let authors know what to expect in terms of how submissions will be handled. We have the announcement of the 2010 IEEE medal winners and newly elevated IEEE Fellows from our society – warmest congratulations to all on your achievements

IEEE Information Theory Society Newsletter

IEEE Information Theory Society Newsletter (USPS 360-350) is published quarterly by the Information Theory Society of the Institute of Electrical and Electronics Engineers, Inc.

Headquarters: 3 Park Avenue, 17th Floor,
New York, NY 10016-5997.

Cost is \$1.00 per member per year (included in Society fee) for each member of the Information Theory Society. Printed in the U.S.A. Periodicals postage paid at New York, NY and at additional mailing offices.

Postmaster: Send address changes to IEEE Information Theory Society Newsletter, IEEE, 445 Hoes Lane, Piscataway, NJ 08854.

© 2010 IEEE. Information contained in this newsletter may be copied without permission provided that the copies are not made or distributed for direct commercial advantage, and the title of the publication and its date appear.

IEEE Information Theory Society Newsletter
9-26

Table of Contents

President's Column	1
From the Editor	2
The Historian's Column	3
New IEEE Fellows as of January 2010	4
IT Society BoG Member Nominations	4
2010 IEEE Medal Recipients	5
It's Easier to Approximate	6
Golomb's Puzzle Column: Calendar Puzzles	12
Golomb's Puzzle Column: More Pentomino Exclusion Solutions	13
Best Editorial Practices	14
Workshop Report: ITW'09 in Taormina, Sicily, Italy	17
Meeting Report: Paths Ahead in the Science of Information and Decision Systems	18
Minutes of BoG Meeting, Taormina 2009	21
Call for Papers	27
Conference Calendar	32

The time has come to reveal a “secret” side-activity of a small subgroup of members of our Society. It has been known as ITSW, which stands for Information Theory Skiing Workshop. This workshop belongs to the class of “extra-curricular” activities in which some

New IEEE Fellows as of January 2010

The following list of IT Society members have been elected to the grade of IEEE Fellow as of January 2010. The society memberships and the endorsing society are indicated for each individual.

Martin Bastiaans	IT::SP	SP	Robert Nowak	IT::COM::SP	SP
Roy Cideciyan	COM::IT	COM	Ramesh Rao	COM::IT	COM
Hesham El-Gamal	SP::COM::IT	IT	Christian Schlegel	IT::COM	COM
Bart Kosko	CIS::IT::SMC::SP	CIS	Robert Schober	VT::COM::IT::SP	COM
Gerhard Kramer	IT::COM	IT	Madhu Sudan	none	IT
Ping Li	COM::IT	IT	Giorgio Taricco	none	IT
Victor Miller	COM::IT	IT	Mahesh Varanasi	IT::COM	COM
Aria Nosratinia	IT::SP::COM	COM	Howard Yang	VT::CAS::CE::COM:: SP::IT::ED::BT::SSC	CAS
			Ram Zamir	IT	IT
			Zoran Zvonar	VT::COM::IT	COM

IT Society BoG Member Nominations

The Board of Governors (BoG) is the governing body of the IEEE Information Theory Society. The Nomination and Appointments Committee welcomes suggestions for candidates for the BoG.

Suggestions should be sent to Dave Forney (forneyd@comcast.net), preferably before April 1. Members may also make nominations directly by petition; see the IT Society website.

President's Column *continued from page 1*

It is my honor and privilege to serve as the 2010 IEEE Information Theory Society president. I am delighted to be surrounded by an excellent group of officers in Senior Past President Dave Forney, Junior Past President Andrea Goldsmith, First Vice President Giuseppe Caire and Second Vice President Muriel Médard. I am grateful to outgoing treasurer Anant Sahai for his deft handling of the Society's finances in the past three years, and for providing me with a good overview of the financial picture. I welcome incoming treasurer Nihar Jindal and look forward to working both with him and with Society Secretary Aria Nosratinia this year. The Board of Governors of the Society is an outstanding and

dedicated group who will see to it that the Society continues on a trajectory that supports technical excellence in a tradition of collegial interaction.

Finally, I wish to thank my predecessor, Andrea Goldsmith, for her leadership and tireless efforts on behalf of the Society, both during her Presidency and before. Hers will be a tough act to follow.

If you would like to get more involved in the activities of the Society or share your comments, please contact me at frank@comm.utoronto.ca.



It's Easier to Approximate

Plenary talk presented at the 2009 IEEE International Symposium on Information Theory, Seoul, South Korea

David Tse

Abstract

Shannon provided an exact characterization of the fundamental limits of point-to-point communication. After almost 40 years of effort, meeting the same goal for networks proved to be far more difficult. In this talk, we argue that much broader progress can be made in network information theory when instead one seeks approximate solutions with a guarantee on the gap to optimality. We discuss a specific approach focusing on the practically important models of linear Gaussian channels and Gaussian sources.

I. Introduction

In his seminal paper [1], Shannon provided a complete solution to the fundamental limits of point-to-point communication. Since the coding schemes allowed are of arbitrary block lengths, the original design problem is an infinite-dimensional optimization problem. Yet, the optimal solution can be expressed as that of a finite-dimensional optimization problem ("single-letter" characterization). Moreover, for many specific channels and sources, this finite-dimensional optimization problem can be solved explicitly in closed form. This desirable state of affairs is remarkable and almost unique among engineering fields, but it also sets a high standard for the information theory field.

A holy grail of information theory is to extend Shannon's point-to-point result to the network setting. The general network information theory problem is to analyze the fundamental limits of communication when multiple senders want to communicate with multiple receivers with the help of intermediate nodes. The first success came in the earlier 1970's, when Ahlswede [2] and Liao [3] independently provided a single-letter characterization of the capacity region of the multiple access channel. In this network, K users want to send information to a common receiver across a noisy channel. This result is rather general in the sense that it holds for arbitrary number of users as well as arbitrary channel statistics. It led to much excitement in the field at that time. However, as it turned out, there have been essentially no other network information theory results of such generality since then. Most of the other results, for example, hold for only two users (such as the degraded message set problem for broadcast channels) or for specific class of channel or source statistics (such as degraded broadcast channels). Even these results are few in number. So despite almost forty years of effort, it is fair to say that we are still very far from solving the general network information theory problem.

A class of channels and a class of sources that have received much attention are linear Gaussian channels with quadratic cost constraint and Gaussian sources with quadratic distortion measure respectively. Not only are these models practically relevant for applications such as wireless and sensor networks, the physical meaningfulness of their structures give some hope that Gaussian problems are easier to solve than the general case. Indeed, as is well-known, the capacity of the point-to-point Gaussian chan-

nel and the rate-distortion function of the Gaussian source are known in closed form. Can this luck help us make more progress in Gaussian network problems than in the general case? The answer is yes for broadcast channels. While the capacity region of the general broadcast channel is open even in the case of two users, the capacity region of Gaussian broadcast channels with arbitrary number of users is known. However, it seems that the luck ran out rather quickly as most Gaussian network problems are still open. Examples are interference channels (even the two-user case is open), relay networks (even the single-relay channel is open), multiple description and distributed lossy source coding (both open for more than 2 users). So it seems that Gaussian network problems are not too much easier than the general ones.

In this talk, we outline a recent approach to make progress in Gaussian network information theory problems. The idea is to seek approximate solutions rather than exact solutions. Rather than asking for exact solutions for network problems, we recognize that network problems are far more difficult than point-to-point problems and are willing to settle for approximate solutions. Not any old approximate solutions however, but approximate solutions with a hard guarantee on the gap to optimality.

Approximate solutions to information theory problems are not new. However, they are by and far isolated results each with its own proof technique. What distinguishes the approach we advo-

problem is open, the deterministic broadcast channel is solved (independently by Pinsker [4] and Marton [5]). Similarly, lossless source coding problems are often easier than lossy ones. For example, while the general lossy distributed source coding problem is open (even for two users), the lossless distributed source coding problem is solved (the celebrated Slepian-Wolf Theorem [6]).

Because this approach in effect decouples the effect of the noise and the signal interaction, it does not in general yield exactly optimal solution. (Although sometimes one can get lucky, as we will see.) The approximation becomes relatively more accurate when the noise is small compared to the signals (interference-limited or low-noise regime). So while the worst-case gap holds for all parameter ranges, the performance gap is more meaningful in the low-noise regime where the achievable rates are high. The dual statement for source coding is that the approximation using this approach becomes relatively more accurate when the target distortion levels are small and the required rates are high.

In the rest of the talk, we will illustrate this approach using the four open problems mentioned above.

II. Interference Channels

A. *Strong Interference*

The capacity region of the 2-user Gaussian interference channel (IC) (Fig. 1(a)) is one of the long-standing open problems in network information theory. Two users interfere with each other

- s_{+1}, s_{+2}, \dots appear below the noise level at both receivers.

This decomposition suggests a way to approximate the Gaussian IC by a El-Gamal-Costa IC. Since s_{+1}, s_{+2}, \dots are below the noise level at both receivers, they convey little information but also have little interfering effect, being masked by the noise. Let's ignore them entirely and assume the transmit signal s_1 is just $s_{-1}, s_{-2}, \dots, s_{-2}$. Of these bits,

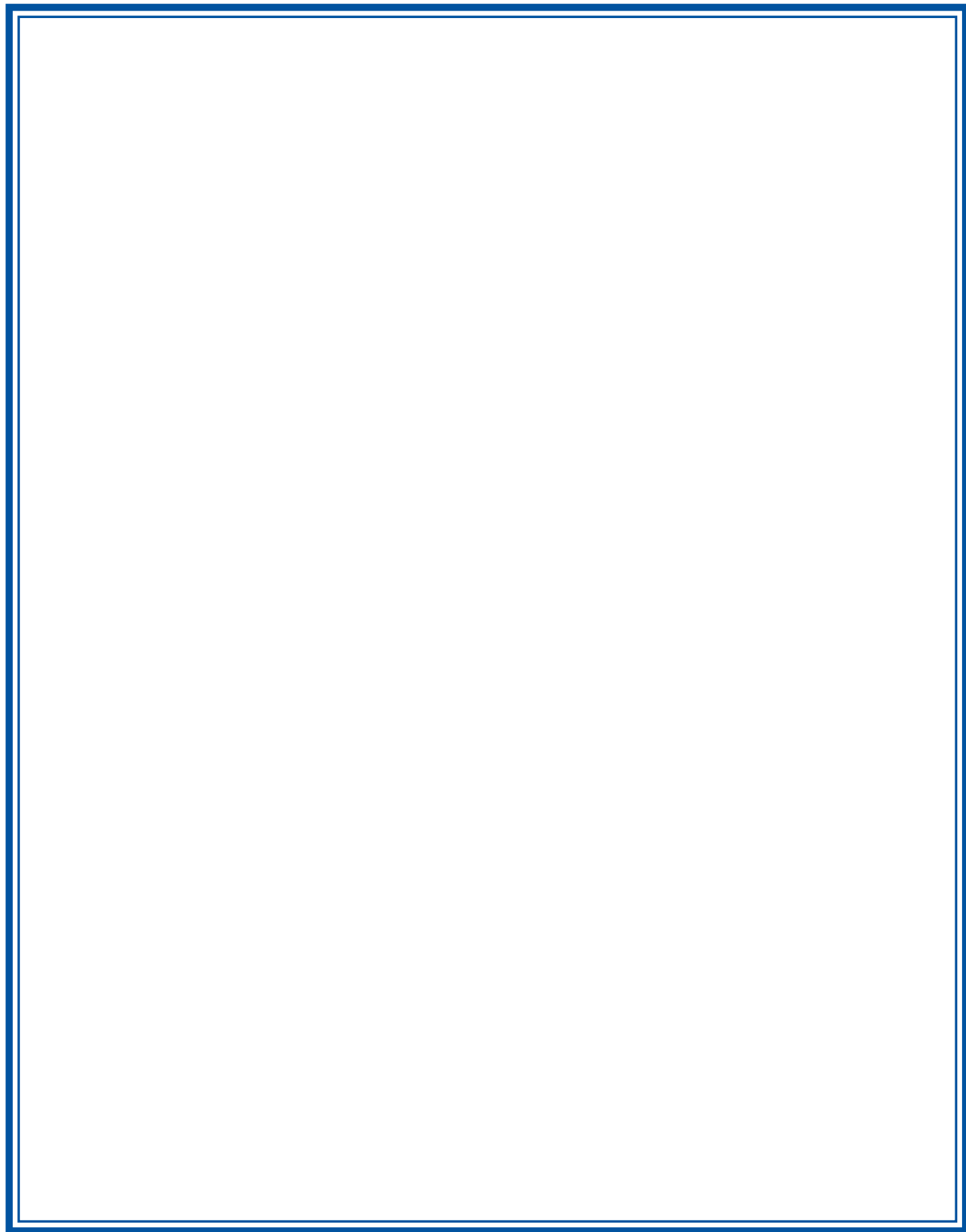
source encoder only has to focus on the first k bits and the lossy problem of recovering to distortion d is replaced by a k -bit problem of recovering

quantization, and use Slepian-Wolf binning to remove the redundancy in the encodings. So in effect, only one copy of x_1, x_2, x_3 are sent.

But this is still wasteful! The decoder does not actually need any copy of x_1, x_2, x_3 ; it only needs x_1, x_2, x_1, x_2 to compute the difference bits x_1, x_2 . So what is needed is a quantizer for x_1 to extract only the less significant bits (x_1, x_2) and a quantizer for x_2 to extract x_1, x_2 . A (random) Gaussian quantizer will not do; the five significant bits are all mixed up in the representation. Rather, what is needed is a lattice quantizer, consisting of a coarse lattice representing the most significant bits (x_1, x_2, x_3) and a fine lattice representing the less significant bits (x_1, x_2 for x_1 , and x_1, x_2 for x_2). Each encoder only needs to send the fine lattice index of the quantized vector. This scheme was proposed by Krithivasan and Pradhan [31] and shown to be within 1 bit/sample to optimality by Wagner [32].

V. Conclusion

Traditionally, analysis of Gaussian network information theory proceeds by finding a good Gaussian scheme and then proving a converse using an extremal information inequality for which Gaussian is tight. This approach is problematic because: 1) we don't have too many such inequalities in our arsenal (basically entropy-power inequality and its variants) and inventing new ones is difficult; 2) Gaussian schemes may be very far away from being optimal (as we saw); 3) the analysis is very much tied to the details of the Gaussian noise/source model. The approximation approach tries to circumvent these difficulties. Moreover, it has the added bonus of connecting Gaussian problems with other problems such as network coding and lossless source coding, and thus helps to shed more light into the structure of the network information theory field as a whole.

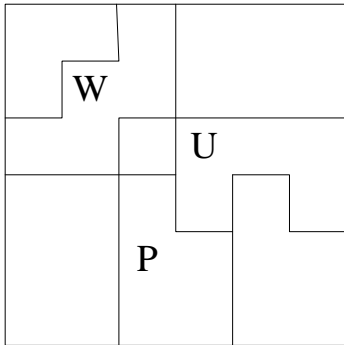


More Pentomino Exclusion Solutions

Solomon W. Golomb

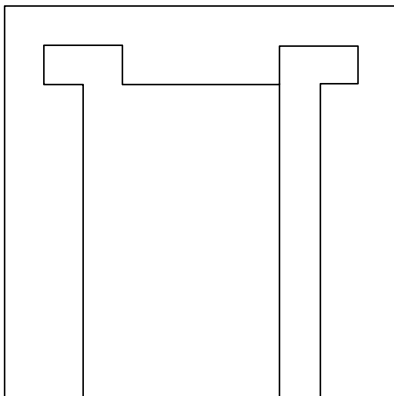


1)



Here, the P, U, and W prevent any of the other 9 pentominoes from fitting on the 6×6 board. (The challenge was to avoid using any of the I, L, or V.)

2)



Best Editorial Practices

Ezio Biglieri

Introduction

In the following, I have collected a set of recommendations for Asso

- 3) The AE is overwhelmed by previous assignments, or he has duties preventing him from attending his editorial job with due diligence. In this case, the EiC should be promptly informed about the time interval in which assignments to that AE should be slowed down or suspended.

2 3

Step 3: AE Decides on the Suitability of the Manuscript

Before looking for potential reviewers, the AE reads the paper and returns it to its authors without reviews if one or more of the following situations occur:

- 1) The manuscript is badly written. Although the review process can assist with fine tuning of the presentation of an acceptable article (especially when the authors' mother tongue is not English), neither the AE nor the reviewers are expected to convert the paper into an appropriate style. The I_EE_E A_E clearly states that "the body of the paper should be understandable without undue effort by its intended audience."
- 2) The paper is out of scope, as it has no information- or communication-theoretic relevance. In this case, rejection should be carefully motivated, and whenever possible the authors should be referred to other journals where the manuscript could be submitted.
- 3) The manuscript is unsuitable for technical reasons (for example, it contains a weak idea supported only by simulation results with no mathematical analysis, or its technical or theoretical contents are too shallow).

If the AE decides that the manuscript will be sent out for review, it might be appropriate to inform its authors.

Step 4: AE Sends Manuscript out for Review

This, along with making the editorial decision, is the hardest part of the process. Here, the substeps are (i) Identifying good potential reviewers, (ii) Soliciting the reviews, (iii) Getting reviewer agreement, and (iv) Getting the reviews back. The typical number of reviews which the AE should obtain to make an informed editorial decision is 3 (less than three is generally not a good option), with reviewers chosen among knowledgeable colleagues, authors of referenced papers, and authors on related topics (to be searched in IEEE Xplore and possibly Google). More than three might be identified initially in case one or more declines. When contacting reviewers, the AE should include a deadline for reviewers to accept the review, with reminders if they do not respond one way or another within a few days. It is recommended that the AE negotiate the review deadline with reviewers (this could range from 5–6 weeks for an average paper to maybe 8 weeks for longer or denser papers), but once a deadline has been agreed upon the AE should keep on soliciting – politely but firmly – the reviewer, with wording getting more and more urgent, and even making a phone call when email reminders do not suffice. I strongly recommend avoiding automated reminders, as in many cases they tend to be disregarded, or worse cause a

good deal of irritation. Review reminders should be sent immediately after a deadline has passed, to make it clear that the deadline was a firm one. In some cases the AE may want to submit his own review, which can be done either anonymously or (better) openly.

A

Step 5: AE Makes The First Editorial Decision

This is a most critical step. Once all reviews requested are in (or there is no hope of receiving more), the first editorial decision should be made. It will be based on the reviews obtained, but most of all on the AE's judgment (remember that

). There are at least six types of editorial decisions:

- 1) **Accept as is.** This occurs very seldom, and requires no further comment.
- 2) **Accept with recommended changes.** This occurs when only cosmetic changes are needed. The AE will list them, and ask the authors to upload the final version of their revised manuscript. No further round of review will be necessary, only AE reading.
- 3) **Accept with mandatory changes.** If the manuscript is very likely to be accepted, but major changes are needed, the AE will list these carefully, and ask the authors to upload their revised copy for additional review, along with their rebuttal and a list of the changes made. I_EE_E A_E O_E. The AE should examine the revised manuscript and, whenever possible, exercise his own judgment to decide if his original requests were complied with. If not possible, he will send the manuscript out for rereview to all or a subset of the original reviewers, with very specific requests for comments. The AE should avoid the practice of forwarding the revised manuscript to all reviewers and asking them to assess if it is now ready for publication, as in this case the reviewers feel obligated to read the entire paper rather than a specific part, which typically causes long review delays.
- 4) **Conditionally accept/reject.** This kind of decision should occur seldom, and be made only when the original manuscript contains technical flaws. If the paper is a nice contribution, the paper should be conditionally accepted, if not then the paper should be rejected. The action required from the authors may need some discussion (via the AE) between the authors and the reviewer identifying the flaw. In any case, the action required from the authors for possible acceptance must be made explicit and clear. The observations under point 3 are also valid in this case.
- 5) **Reject, and recommend resubmission.** If the amount of mandatory changes needed is very large, and probably requires a revised manuscript that differs widely from the original submission, the decision should be a "reject," accompanied by the recommendation that the paper be overhauled and resubmitted afresh.

- 6) Reject without recommending resubmission.** If the paper cannot be fixed up because of fatal flaws or other imperfections, it should be rejected without any hint to a possible resubmission.
- a) The most relevant features of a manuscript that should be considered for an editorial decision are:
- The weight of its technical contribution, compared with its length (should the manuscript be shortened without impairing legibility, or lengthened?).
 - The quality of the technical writing.
 - The organization of the material.
 - Sufficiency of abstract and bibliography.
- b) Note that simply relaying the reviews to the authors, without describing explicitly what changes should be made to the manuscript and categorizing each of them as either mandatory or recommended, is
- c) The authors should be given a . The time allowed for revision depends on the amount of changes needed and is negotiable, but in any case should be enforced strictly. Two-three months is a reasonable time.
- d) Paraphrasing a famous quote from Tolstoj's *Anna Karenina*, "A" . This means that the reasons for rejection should be carefully summarized by the AE, rather than simply left to a reading of the reviews.
- e) Overaggressive reviews () should be rejected outright, bowdlerized, or summarized by the AE to prevent unnecessary contention.
- f) If a reviewer feels that a manuscript is plagiarized (or - , which means that it is published or submitted elsewhere or in part), the EiC should be immediately informed.
- g) Please respond quickly to authors' inquiries. A lot of the grief the EiCs deal with comes from the fact that some AEs had terrible email etiquette, and simply do not respond to authors' inquiries. Not only is this behavior unacceptable in today's world of electronic communications, but it tends to exacerbate situations that are already difficult. More generally, AEs should give regular status updates to authors when papers are delayed. This is likely to defuse many problems.

Step 6: AE Makes Final Decision On Revised Manuscript

Once the revised manuscript is submitted, the AE should verify that his requests are satisfied by reading the manuscript and the rebuttal. Some light editing may be necessary, for example to repair a problem with a technical overtone that IEEE will not spot.

A very frustrating situation for authors, and one that should be avoided, is when an AE does not take a stand on a point of contention between authors and reviewers. There is no reason why the author should necessarily be considered wrong, and the reviewer right, in such a situation. Lack of AE decisiveness is a major source of delay, and also a major source of annoyance to the EiC.

It is appropriate, albeit not mandatory, to copy the EiC on final decision letters.

In the case of a strong disagreement between AE and author(s), the EiC should immediately intervene to prevent them from engaging in a quarrel.

Acknowledgments

I wish to thank my colleagues Helmut Bölcskei, Giuseppe Caire, Dave Forney, Larry Greenstein, Vince Poor, Paul Siegel, Alex Vardy, several Associate Editors, and especially Andrea Goldsmith, for their generosity in providing me with comments and suggestions for improvement.

committee, the invited session organizers, and the poster session organizer, for their painstaking work.

On Wednesday afternoon, social events include tours to the Etna mountain (the highest active volcano in Europe) and Taormina city (including the Greek-Roman theatre, the Roman Odeon, Palazzo Corvaja dated 1300, and corners of the medieval centre) tours. On Thursday evening, a gala dinner was held in San Domenico Palace Hotel, built on the site of a 15th century monastery. During the dinner, the IEEE Donald G. Fink Prize Paper Award, sponsored by IEEE Life Members Committee, was presented by the Society President Andrea J. Goldsmith to Daniel J. Costello, Jr. and G. David Forney, Jr., for their paper entitled “Channel coding: the road to channel capacity”.

On Friday afternoon, a poster-award buffet was organized. Best-poster awards were given to the following two papers: “Higher Dimensional Perfect Space-Time Coded Modulation,” by Frédérique Oggier and Patrick Solé, and “On optimal constellations for BICM at low SNR,” by Erik Agrell and Alex Alvarado.

All volunteers involved in ITW'09 Taormina should be thanked for their work, which resulted in a smoothly run and technically rewarding workshop.

Meeting Report: Paths Ahead in the Science of Information and Decision Systems

Laboratory for Information and Decision Systems (LIDS),
Massachusetts Institute of Technology

November 12–14, 2009

Alan S. Willsky

A significant meeting, the symposium on “Paths Ahead in the Science of Information and Decision Systems” was held November 12–14, 2009 at MIT. This meeting was organized and run by MIT’s Laboratory for Information and Decision Systems (LIDS), the oldest continuing laboratory at MIT. LIDS has played and continues to play a major role in the development of our field, responding to critical national and societal needs; developing fundamental and path-breaking advances in theory, methodology, and practice; and serving as a focal point for activities involving the best across MIT, the nation, and the world.

The science of information and decision systems encompasses a substantial and exceptionally pervasive set of interrelated disciplines, ranging from signal and image processing; to embedded control systems; to the analysis, design, and optimization of complex distributed systems and networks. Thanks both to the richness of the challenges throughout engineering and the physical, biological and social sciences, and the continuing developments of the foundations of our disciplines, the information and decision sciences stand today as an exciting, continually evolving, and critical domain of intellectual inquiry.

Consistent with that history and mission, LIDS organized the Paths Ahead Symposium, bringing together leading researchers from all around the world who have been influential in shaping the vision of and leading this broad field. The meeting, which was

sponsored by MIT’s School of Engineering, by a number of pri-

(MIT). **John Doyle** (Cal. Tech.) was the lead speaker in the session, together with a panel consisting of **P.R. Kumar** (Illinois), **Asuman Ozdaglar** (MIT), **H. Vincent Poor** (Princeton), **Balaji Prabhakar** (Stanford), **Jeff Shamma** (Georgia Tech.), and **David Tse** (UC Berkeley). In his presentation John Doyle gave a far-reaching discourse on networks, layered systems, their fragility and challenges in their design, as well as a contrasting view of some man-made networks (the Internet, power grids, etc.) and biological systems (e.g., bacteria), pointing out similarities, differences, and challenges for those of us in the information and decision sciences. The presentations of other panelists included: an examination of application and domain challenges (including wireless security and multimedia communications) to “pull” the development of methodology and the “push” of specific technical challenges (e.g., in information theory and finite-block-length capacity); an examination, through example, of why it is worthwhile to continue examining very hard problems and looking for ways in which to reformulate them creatively in ways that overcome technical difficulties and lead to new results and insights; an examination of the serious challenges in the interplay of networks and information (including control of distributed systems over unreliable networks, methods for verifying performance, and distributing information processing as a problem blending computation, communication, and inference); the design of incentive systems for complex transportation networks in order to influence behavior and reduce congestion; challenges and opportunities in network games and in understanding dynamics, learning, and decision-making in social and economic networks.

The Saturday afternoon panel discussion, focusing on signal processing, inference, and learning, was chaired by **Alan Willsky**. The lead speaker in this session was **Michael Jordan** (UC Berkeley), who was joined on the panel by **Alfred Hero** (Michigan), **Sanjeev Kulkarni** (Princeton), **Robert Nowak** (Wisconsin), **Pietro Perona** (Cal. Tech.), **Devavrat Shah** (MIT), and **Martin Wainwright** (UC Berkeley). Mike Jordan’s presentation provided an overview of the broad area of machine learning and its ties to problems in a

vast array of fields. In this presentation he provided a view of current trends in machine learning including: Nonparametric Bayesian methods (with applications in signal and image processing highlighted), the challenges that the availability of massive data sets presents to those in learning and modeling; the investigation of “Objective Bayes” methods which provide a unifying blend between Bayesian and frequentist views of statistics, with many ties to information theory; the great interest in methods that capture or recover “sparsity” in one form or another; and the challenge of bringing control and statistics together in the same synergistic way as optimization and statistics. Other presentations provided discussions of machine learning challenges in computer vision (e.g., so that one can search on parts of images or so that we can capture a human’s ability to recognize new objects quickly); the challenging dynamic learning problems embedded in the operation of engineered networks (e.g., medium access control) and the role of so-called message passing algorithms; the challenges and opportunities in confronting increasingly high-dimensional data sets (with applications in learning graphical models) and the “blessings” as well as the well-known curses of dimensionality (with applications in sparse reconstruction and the uncovering of scaling laws) as well as the posing of a question seen in other sessions as well, namely the tradeoff between computational effort and performance; the challenges in

that prompted our inviting participants to continue this conversation and to provide short perspective and position papers through the end of 2009. The website for this meeting <http://paths.lids.mit.edu> includes not only a statement of purpose, agenda, list of sponsors, etc., but also a complete collection of

files generated by this meeting. This includes (a) video of the entire meeting; (b) all panelist slides; (c) short perspectives and position papers submitted by attendees; and (d) a summary document produced by Munther Dahleh, John Tsitsiklis, and Alan Willsky.

Minutes of BoG Meeting, Taormina 2009

October 13, 2009, Taormina, Italy

Muriel Médard and Aria Nosratinia

Attendees: Andrea Goldsmith, Dave Forney, Muriel Médard, Dan Costello, Gerhard Kramer, Vince Poor, Hans-Andrea Loeliger, Nihar Jindal, Giuseppe Caire, Helmut Bölcskei, Nick Laneman, Ezio Biglieri. The following attended by phone: Michelle Effros, Ken Zeger, Frank Kschischang, Prakash Narayan, Tracey Ho, Aylin Yener.

The meeting was called to order at 19:00 hours by the Society President Andrea Goldsmith, who greeted the members of the board.

1. By consent, the board approved the minutes of the previous meeting with the following changes: Emina Soljanin and Dave Forney were not present at the last BoG meeting.
2. The agenda was approved by consent.
3. The president presented her report. The society is in good shape, with a great number of activities. The finances are in good shape. The looming issues include new changes to the IEEE Explore revenue due to new rules, which could put the society in the red. The end of the term of the Editor in Chief of the Transactions is on the horizon. Other issues include changes in paper handling system (Manuscript Central) for our Transactions. The new distinguished lecture program will start next year.

Our Transactions continues to be highly prestigious and highly cited, although the “sub to pub” time (publication delay) has remained essentially unchanged so far despite our efforts. The committees are very active, society members get many awards per capita, new chapters have been instituted, and the society’s new website is very successful.

We still have a large budget surplus. It is unlikely there will be a large proposal to spend the surplus this year, which otherwise goes to our reserves, whence spending is heavily limited by the IEEE rules. Reserves are down by \$1.2M and now stand at \$1.8M, taking us to 2006 levels. Market recovery is likely to be reflected later in our reserves. Reduced IEEE Explore fees may reduce our income by about \$120K, which is a substantial hit. Library subscriptions are also generally trending downwards. Among the possibilities to be considered for increasing the surplus: new publications, tutorials or magazines, increase print charges, as well as sponsorship for IT School and Distinguished Lecturer program.

On the subject of governance: we need to push BoG members to become more involved in committees. Most BoG members have expressed their interests and preferences in service in committees to the president, who will make use of this information

and forward it to the Nominations and Appointments Committee. The Publications Committee by rule consists of associate editors, publication editors, and newsletter editor. Should we change the by-laws and include (some) BoG members in the Publications Committee? There is little flexibility from bylaws in assigning members to some of these committees (e.g. Shannon Award Committee).

A subcommittee is being considered to help with sub-to-pub time. Ezio Biglieri has put considerable effort in the sub-to-pub effort, and the President has made this a central issue of her tenure. Our current sub-to-pub is the highest in the IEEE. The reduction of publication delay involves both cultural and administrative challenges in our society.

There have been initiatives to address this problem: The number of associate editors has been increased. Moving our web-based manuscript handling from Pareja to Manuscript Central should allow better tracking of papers. A new “best practices” document is being developed. Budget has been assigned for a half-time person as managing editor, who helps track papers and sends reminders to associate editors about the status of papers. A task force is being contemplated to monitor and improve sub-to-pub, which might become a standing Steering Committee. The president indicated that we must become more businesslike in our paper processing; develop an editorial policy for authors and reviewers; create and impose firm deadlines, while leaving leeway for editor judgment; track the statistics on associate editors, reviewers, and authors. There have been suggestions to publish the statistics and highlight the issue to the community at large. The task force for sub-to-pub is generally well received by the BoG.

There have been changes to IT paper awards process (bylaw). Open call nominations go to the Awards Committee chair. The Publications Committee generates a separate list of nominations. The Awards Committee recommends up to 3 papers (3 weeks before ISIT). In the annual BoG meeting, the BoG votes to accept Awards Committee report or asks for revision; if accepted a vote is taken.

The Baker prize was endorsed by the IEEE TAB and Awards Board. It will be submitted to IEEE Board of Directors at their November meeting. The Baker prize will recognize, in the 3-5 year window prior to nomination, contributions to the fundamentals of electrical engineering, computing and related arts and sciences within the IEEE. This prize went from a near-dead proposal to one co-sponsored technically by 19 societies, with great help from Jose Moura (SP).

The new officers for 2010 are as follows. President Frank Kschischang, 1st VP Giuseppe Caire, 2nd VP Muriel Médard, Junior Past President Andrea Goldsmith, Senior Past President G. David Forney, Secretary Aria Nosratinia, Treasurer Nihar Jindal. The service of the outgoing treasurer Anant Sahai was recognized. In addition, Bixio Rimoldi was recognized for his exceptional service over his five year officer term, which ends this year. Election for 6 new BoG members closed the day before the current BoG meeting. Results will be known by Oct 12. For the first time web-based voting was used for this election. The BoG meetings for the next year have been announced by Frank Kschischang. The BoG meetings take place at noon Sunday January 31 just before the ITA workshop, at noon Sunday

4. The treasurer's report was presented by Nihar Jindal, the incoming treasurer, for current treasurer Anant Sahai. The society has approximately \$100K surplus, so that shifting expenses to this year would be beneficial. Otherwise the surplus will go into reserves controlled by IEEE which does not allow ready access for projects. ISIT and ITW did well financially and the current ITW will be close to breaking even.

There is long term uncertainty about our finances. About \$200,000 in print subscriptions, mostly by university libraries at approximately \$1,000 per institution, is in doubt (example: MIT and UC Berkeley). We expect that IEEE Explore revenue sharing may be decreased by \$120K starting next year.

We effectively subsidize member print transactions, costing us \$70K. Reduction in this subsidy some years ago was intended to phase out subsidies eventually. For long term stability we need to increase transactions revenue (reducing sub-to-pub should help), maybe also increase surplus in conference fees, membership dues, sponsorship for IT schools and the distinguished lecturer program.

5. The Constitution and Bylaws Committee report was presented by the Junior Past President Dave Forney. The amendments will be published on the society website. The changes in the bylaws are modest except in prize paper category, as discussed in the President's report. Nominations and Appointments Committee will not appoint any of its members to any committee. For the Awards Committee language, listing of the specific awards was removed and replaced with category of awards. Ezio Biglieri has suggested changes in the Publications Committee. Frank Kschischang and Andrea Goldsmith have revised the prize paper awards to reflect the discussion at the ISIT BoG meeting. All proposed changes were approved by the BoG.
6. The Publications Committee report was presented by the IT Transactions Editor in Chief, Ezio Biglieri. At this time we have 46 associate editors, up from 26 in June 2007. The Editor-in-Chief highlighted the dichotomy of senior vs junior associate editors. Junior editors are more eager and motivated, while senior people often do not even accept the appointment.

The following appointments to associate editor were proposed and approved: Gerard Cohen, Navin Kashyap, Jean-Pierre Tillich, Pascal Vontobel.

Several questions were raised by the editor in chief. Should only tenured individuals be appointed to associate editor? (Noting that several of the recent appointments are not from academia.) The question of loading untenured junior faculty was raised, as well as the potential for unwanted influence, for example getting recommendation letters for tenure from people whose papers they may have handled. There is no hard and fast rule, but it is preferable that editors be tenured, although there may be extenuating circumstances (for instance previous career in industry). The question was raised whether a BoG vote is necessary for appointment of editors, which was answered in the affirmative. The question was raised whether appointments can be done by e-mail or only in BoG meetings. Some preference was expressed for BoG meetings, with the possibility of appointing acting associate editors.

A Best Editorial Practices document is being prepared with instructions for new associate editors, with the goal of the reduction of sub-to-pub time. A training session may be organized for associate editors at the ISIT.

Feb 2011, two years after passing of Ralf Koetter and also marking the tenth anniversary of codes on graphs special issue that Ralf co-edited. This can be linked with Fest for Ralf Koetter in Fall 2010. Authors will be invited to submit to both the fest and the special issue, but not necessarily with full overlap. The BoG expressed support of the two special issues and puts the details into the hands of the Editor-in-chief.

Regarding web-based manuscript management: migration of all data from Pareja to Manuscript Central (MC) is not automatically feasible, so both will co-exist until all Pareja papers arrive at the end of their editorial life. In the mean time associate editors will use two websites. Pareja will be progressively offloaded, and hence more stable (disk size a major problem currently). At some point in the future, all new papers will be submitted on MC; this will start by the end of the year or may be delayed until the term of the next Editor-in-Chief begins in June 2010.

Some recent statistics were presented by the EiC. Sub to pub time average was 97.2 weeks in July 2009 and 99 weeks in October 2009 (the latter average reduces to 85 weeks after removing 3 outliers).

IEEE is preparing a new author gateway in October, to help keep track of papers.

The workshop was proposed to be located in Paraty, a small village and a historical

The Padovani lecture by Abbas El Gamal at the North American IT School was very

Call for Papers: Special Issue of the IEEE Transactions on Information Theory

A special issue of the IEEE Transactions on Information Theory, envisioned as a tribute to the scientific legacy of Ralf Koetter, will be published in early 2011. The scope of the special issue encompasses all aspects of coding theory (both algebraic and probabilistic), network coding, turbo equalization, as well as other topics in networks and signal processing. Ralf Koetter worked in all these areas and forged numerous ground-breaking connections among them. Further exploring these exciting connections is one of the goals of this special issue. Another goal is to highlight the many new facets of coding theory that emerged during the past decade, largely owing to the contributions of Ralf Koetter.

Original research papers, as well as expository and survey papers, are sought, both invited and contributed. Papers submitted to this special issue should relate in some way to the work of Ralf Koetter. Sample topics include, but are not limited to, the following:

- Algebraic theory of network coding and its applications
- Analysis of iterative algorithms in graphical models
- Codes on graphs: realization complexity and constructions
- Efficient decoding (especially list-decoding) of algebraic codes
- Error-correction in networks, both coherent and non-coherent
- Turbo equalization and related topics in signal processing

The deadline for submission of manuscripts is April 15, 2010, and early submission is encouraged. All submissions will undergo a rigorous peer review, handled by one of the Guest Editors.

A special Workshop titled “Facets of Coding Theory: from Algorithms to Networks” and dedicated to Ralf Koetter will take place at the Allerton House, Monticello, Illinois, from Sunday, September 26, until Tuesday, September 28, 2010, immediately prior to the Forty-Eighth Annual Allerton Conference. Authors of papers accepted for the special issue will be expected to present their work at this Workshop. However, presentation at the Workshop will not be a prerequisite for publication in the special issue. Conversely, inclusion of a paper in the Workshop program will not guarantee inclusion in the special issue.

Questions regarding the special issue should be directed to Alexander Vardy at <avardy@ucsd.edu>. Questions regarding the Workshop should be directed to Andrew Singer at <acsinger@illinois.edu>.

SUBMISSION PROCEDURE:

Prospective authors should submit their papers electronically at http://pareja.itsec.org/initial_submission, and adhere to the regular guidelines of the IEEE Transactions on Information Theory, with the following exceptions. In the field labeled “Editorial Area or Special Issue,” please select this special issue. All the papers will be deemed submitted BOTH for publication in the special issue AND for presentation at the Workshop, unless clearly indicated otherwise in the field labeled “Message to Editor-in-Chief.” Authors may also indicate in the same field their preference for a Guest Editor to handle the submission.

SCHEDULE:

Manuscript submission deadline:	April 15, 2010
Notification of acceptance:	August 31, 2010
Final manuscripts due:	September 28, 2010
Tentative publication date:	February 2011

GUEST EDITORS:

Michelle Effros, California Institute of Technology
G. David Forney, Jr., Massachusetts Institute of Technology
Frank R. Kschischang, University of Toronto
Muriel Médard, Massachusetts Institute of Technology
Andrew C. Singer, University of Illinois at Urbana-Champaign
Alexander Vardy, University of California San Diego

Call for Papers





ON COMMUNICATION,
CONTROL, AND COMPUTING

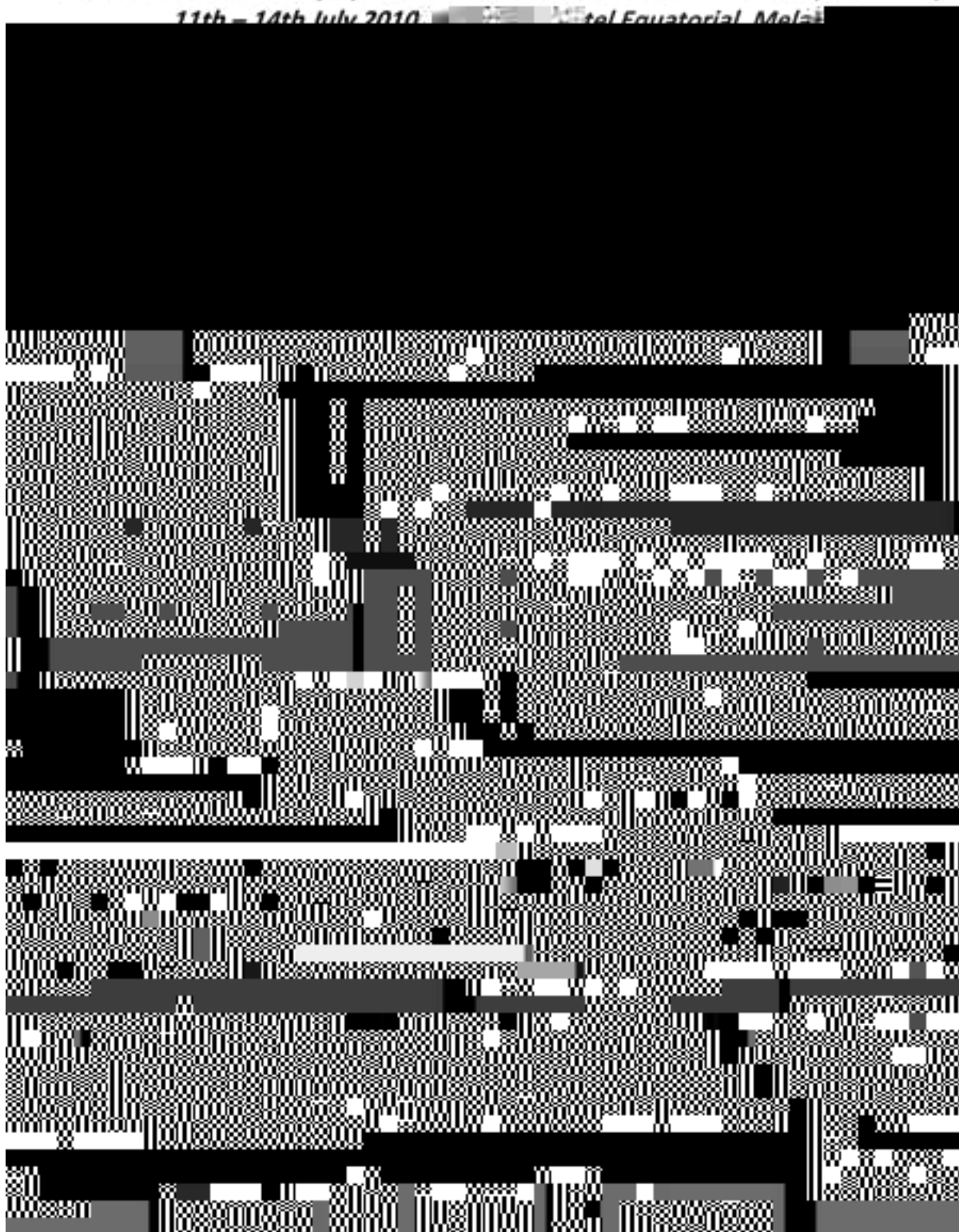
September 29 – October 1, 2010

Preliminary Call for Papers

Call for Papers



*Fourth International Symposium on Broadband Communications (ISBC 2010)
11th – 14th July 2010, Hotel Equatorial, Melaka*



Call for Papers



SETA 2010 SEquences and Their Applica

The sixth conference on
will be held at Telecom ParisTech, Paris, France from

Contact

Patrick Solé
Département COMELEC
Télécom ParisTech
seta2010@telecom-paristech.fr

Invited Speakers

- › Robert Calderbank, Princeton
- › James Massey, ETH Zurich, :
- › Arne Winterhof, Österreichisc
of Sciences)

General Chair

- › Patrick Solé, Telecom ParisT

Local Arrangments

- › Jean-Claude Belfiore, Telecor

DATE	CONFERENCE	LOCATION	WEB PAGE	DUE DATE
March 15-19, 2010	2010 IEEE Conference on Computer Communications (INFOCOM 2010)	San Diego, California, USA	http://www.ieee-infocom.org/2010	Passed
March 17-19, 2010	44th Annual Conference on Information Sciences and	Princeton University, NJ	http://conf.ee.princeton.edu/ciss/	Passed