

IEEE Information Theory Society Newsletter



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Editor: Lance C. Pérez

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President's Column

Hideki Imai



Hideki Imai

The 2004 IEEE Technical Activities Board (TAB) meeting took place in Savannah, Georgia, USA in mid-February. This was the first TAB meeting since the IEEE had gotten out of several years of financial crisis. It was evident at the meeting that the focus of concern had shifted from finances to other forthcoming challenges. At the Society Presidents' forum, held prior to the TAB meeting, the IEEE President said, "We have overcome the financial challenges of the past several years. However,

our publishing models, our ability to develop new products and services, and the overall value proposition of IEEE membership will be tested going forward." The issue of "open access" to IEEE publications became the center of discussion on publishing models during the meeting. This is an important issue that will inevitably affect the future of our Institute.

Open access literature is defined by two essential properties. First, it is free of charge to everyone. Second, the copyright holder has consented in advance to unrestricted reading, downloading, copying, sharing, storing, printing, searching, linking, and crawling. (The only constraint that authors might want to enforce is that no one should distribute mangled or misattributed copies. This is a reason for authors to retain copyright. Authors who do not care to enforce these constraints, or who live in moral countries where they are enforceable even without copyright, could put their works into the public domain without copyright.) Archives and journals made up of such open access literature are rapidly expanding. It is said that there already exist more than 700 open access journals and over one million research papers are freely available on the net?

There are several issues associated with such a rapid development of open access literature. One is, without doubt, the public appreciation of open-access as a cost-effective way to disseminate and use information. There is also evidence that

the articles freely available online are more highly cited, which is of particular interest to scholars. In addition, a bill introduced in the US House of Representatives by Congressman Sabo (D-MN) would mandate open access to resources that have been generated by taxpayer expense.

The proposed bill includes the language that "...Any Federal department or agency that enters into a [contract, grant, or cooperative agreement] with any person for the performance of scientific research substantially funded by the Federal Government shall include in the agreement a provision that the copyright protection under this title is not available for any work produced pursuant to such research under the agreement..." Open access has already replaced, at least partly, the traditional subscription-based publishing model. Whether the House of Representatives passes Sabo's bill or not, it will be hard to stop the spread of open access literature in the future.

However, the popularization of the open access model does not mean that the very existence of academic societies in our field will be in danger. Societies will continue to play an important role in maintaining healthy social developments, as a reliable evaluator of developments in the field, and serving as an advisory agency for government policies. It is essential that we create a structure that will successfully support the transition to open access literature.

The IEEE has put forward the following as possible sources of income in surviving the age of open access literature: 1) article charges, 2) investment returns from an endowment, 3) investment returns from reserves, and 4) e-subscription income. If open access becomes mandated by the law, there is a possibility that article charges will be paid from the government contract or grant. In that case, IEEE expects the \$2,000 article charge alone to cover most of the costs of IEEE e-publications. The income from institutional membership fees is also included in this article charge. (Institutional member's employees/faculty/students would be able to publish articles without paying per article charges.) Moreover, IEEE Xplore (IEL) can expect e-subscription income by providing added value such as a powerful search engine, cross-referencing, or an alerting service.

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From the Editor

Lance C. Pérez



This issue of the *IEEE Information Theory Society Newsletter* is fortunate to have a cryptarithm from Elwyn Berlekamp in celebration of the upcoming 2004 International Symposium on Information Theory to be held in Chicago, Illinois USA. The solution will be posted in the September issue.

Please help make the Newsletter as interesting and informative as possible by offering suggestions and contributing news. The deadlines for the 2003 issues of the newsletter are as follows:

Issue	Deadline
September 2004	July 15, 2004
December 2004	October 15, 2004

Electronic submission, especially in ascii, LaTeX and Word formats, is encouraged. Please keep in mind that any electronic photographs should be high resolution.

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The Historian's Column

A. Ephremides



Today let us engage in some “reverse” history; what is reverse history? One possible interpretation is that we position ourselves somewhere far in the unknown future and look at the present as historical past. I’ll take this interpretation and imagine looking back at today’s world from the vantage point of a future time, when scholars and others try to make sense of what transpired in the past, that is, our present.

I came up with this thought as I kept collecting some odd observations about things going on around us that could not be easily assessed or placed in historical perspective. Are they unimportant? Are they transient marks in our evolution? Or are they significant cornerstones that point the way to the future? I am sure you all have been wondering about such things. For example, is the rock group “Darkness” from England a sorry detail in the evolution of music (if we can call it that) or a harbinger of the loss of lights in our minds? Or is the paper by John Doe and Alice Fairweather on exceeding Shannon Capacity a breakthrough or an aberration suitable for the journal of irreproducible results?

Now that I have you all tuned in, let me expand on my “reverse” historical thoughts. One vexing item for me is the ubiquitous nature of electronic gadgets. In particular, the laptop computer is a fascinating item. Increasingly, we see people carrying them around in airplanes, in trains, on the beach, and almost anywhere else you can imagine. And I am not exaggerating. Recently, while visiting NSF to participate in a Panel, I went to the restroom and, to my amazement, I saw a gentleman emerging from one of the “booths” carrying his laptop. I do not know how long he had been sitting there but I thought that the laptop usage had crossed a significant barrier. It made it into the bathroom!

I must confess that I am nowhere near so dedicated a laptop user. In fact, when I give talks and presentations, I do not of course (heaven forbid) use overhead transparencies anymore (although I grew up with them); they will soon find themselves in a corner of the Museum of Technology (wherever a version of it happens to exist). What I do, in fact, is to bring with me a disc and count on the host making available a PC in which to plug it and proceed with my talk. I must admit, however, that I feel a sense of handicap as I see everyone else carrying their own laptops and studiously looking at their screens as I give my talk. Are they busily working out a counterexample to my claims, are they looking up my background on the internet, or are they simply playing computer games? No matter! My feeling of intimidation has recently been reversed. Indeed, the laptop has become almost as inseparable an item from an individual as one’s wallet. Well, I took heart when Bill Gates, during his last visit to Washington, had someone else carry his own wallet. This is the ultimate status level. So, equivalently, I consider myself “above” carrying my own laptop. Consider: your briefcase will be a good five pounds lighter without a laptop and going through airport security you will only have to remove your garments, a far less demeaning indignity than not being able to turn on your own laptop.

So the question is: What is the way of the future? Will we all have a laptop eventually transplanted on our bodies? Will we be using it even during intimate moments in the bedroom? Who knows? Only those sitting at the vantage point of the future will be able to assess whether taking the PC into the toilet, and sitting on the “throne” with it, was the errant behavior of a misfit or a major step (or “plunge”) for mankind.

But there is more. What about the cell phone? Clearly, just like the case of laptops, we can’t live without them anymore. In fact, there are countries in which people walk around almost always with a cell phone attached to their ear. Sometimes they have tiny speakerphones in their cars and walk with both hands free as they talk and gesticulate. It is almost bizarre to see throngs of people in crowded streets doing what appears to be rehearsing theatrical monologues in fairly loud voices. But again, what drove this issue home for me (or, better, far beyond home) was an unusual sight during a recent trip to Hong Kong. This is one of the places where cell phone “penetration” (as it is called) is approaching 100%. So, in retrospect, I shouldn’t be surprised by what I saw. Yet, the novelty of the spectacle stunned me, just for a moment. On the sidewalk there was a beggar with his hat open upside down in front of him and a cell phone at his ear! He was sitting on the sidewalk, his clothes were typical beggar attire, his eyes were looking somewhere far beyond the passers-by, and he was chattering on the phone. What about? I could not tell. Perhaps checking with a fellow beggar how business was at his site, or perhaps checking with his broker on the latest investments. Come to think of it, a beggar, and especially a homeless one, is the prime example of someone who really needs a cell phone. So, I should not have been surprised.

Now, again, those sitting far in the future will look back upon the sight of the beggar with the cell phone and will be able to decide whether this was an aberration of usage or a crucial turn around the corner in the expanding world of wireless communications. We can only guess.

To see the matter in a different perspective, imagine being a reviewer of Shannon’s 1948 paper in 1948. If you are like many reviewers nowadays you might reject it for considering a “toy” problem, having no real applications whatsoever, and being fraught with lack of mathematical rigor. From today’s vantage point we would of course know that you were an insignificant intellectual peon who had the audacity to criticize a scientific masterpiece. But at that time? Who could be sure?

So, I want to leave you with the question: “will the laptop and the cell phone become universal appendages or will there be a healthy equilibrium in their measured usage?” Some say that the era of prophets is finished, but, I will counter, the era of mini-prophets has just begun.

continued from page 1

However, there is no guarantee that these prospects will prove right. Even if the article charge is paid from a government contract or grant, it may be too optimistic to think that researchers in every country will be supported by their government or institution at all times. We should think about other possibilities as well.

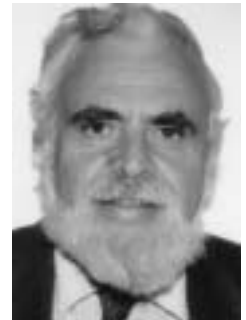
Open access does not necessarily mean that peer review is bypassed. Peer review is medium independent and no more difficult for online journals than for printed journals. In the near future, I believe open archives will be of great importance as online publications become dominant. Our Society is planning to establish an Information Theory subcategory in the arXiv.org e-Print archive. The experience brought by this archive will hopefully give us a

hint in outlining our future business model. The American Physical Society is said to have a system highly appreciated by researchers that consists of a combination of an open archive, Physics e-Print, and a non-open access journal, The Physical Review. The American Physical Society's success indicates that its combined system may be a model to follow in the near future.

At any rate, our Society also needs to make adequate preparations for the future. Information Theory is not unrelated to the issues of open access. In fact, answers to the question about the best way to control the information flow are deeply linked with Information Theory and Cryptology. I hope our Society will contribute greatly in solving the future challenges of the IEEE.

GOLOMB'S PUZZLE COLUMN™

Some Prime Number Properties



Solomon W. Golomb

We let p_n denote the n^{th} prime number ($p_1 = 2, p_2 = 3, p_3 = 5$, etc.), and $\pi(x)$ is the number of primes $\leq x$, for any positive real number x . Note that $\pi(p_n) = n$. The "Prime Number Theorem" of 1896 states that $\pi(x) \sim x/\log x$ as $x \rightarrow \infty$, where "log" is the natural logarithm. In particular, $\lim_{x \rightarrow \infty} \frac{\pi(x)}{x} = 0$, and $\lim_{n \rightarrow \infty} p_n = \infty$.

1. Prove that the ratio $\frac{n}{\pi(n)}$, for $n \geq 2$, takes every integer value > 1 at least once.
2. Let $\{s_n\} = \{n + \pi(n)\}$ and let $\{t_n\} = \{n + p_n - 1\}$, for all $n \geq 1$. Prove that the union of the sequences $\{s_n\}$ and $\{t_n\}$ is the set of all the positive integers, while the intersection of $\{s_n\}$ and $\{t_n\}$ is empty.
3. Given positive integers a and b , show that there exists a positive integer c such that infinitely many numbers of the form $an + b$ (n a positive integer) have all their prime factors $\leq c$.
4. (a) What is the largest integer N such that, if $1 < k < N$ and k has no prime factor in common with N , then k is prime?
(b) What is the largest *odd* integer N such that, if $1 < k < N$ and k has no prime factor in common with $2N$, then k is prime?
5. For what positive integers n is it true that $\sum_{p \leq \pi(n)} p = n$?
6. Let $a_1 < a_2 < a_3 < \dots$ be an increasing, infinite sequence of positive integers.
 - (a) Construct such a sequence $\{a_k\}$ having the property that, for *every* integer n (positive, negative, or zero) the sequence $\{a_k + n\}$ contains only finitely many prime numbers.
 - (b) Is there such a sequence $\{a_k\}$ and a constant $B > 0$ such that, for every integer n (positive, negative, or zero) the sequence $\{a_k + n\}$ contains no more than B prime numbers?

Call for Nominations: Eduard Rhein Foundation Basic Research Award

Joachim Hagenauer

The above photograph shows Claude Elwood Shannon with his wife and Professor Lueke, of the Aachen University of Technology in Bonn Germany. The occasion was the celebration of the Eduard Rhein Award which Shannon received on September 28th, 1991. It was most probably Shannon's last trip abroad. The Eduard Rhein Foundation <http://www.eduard-rhein-stiftung.de/> presents awards in the field of Information Technology. Its "Basic Research Award", which Shannon received in 1991, is the highest award of its kind in Europe.

Other IT Members who have received this prestigious award include:

Gottfried Ungerböck
 Andrew J. Viterbi
 Jacob Ziv
 Ingrid Daubechies
 Robert G. Gallager
 Richard W. Hamming
 Norman Abramson



Claude Elwood Shannon with his wife and Professor Lueke in Bonn Germany

Members of the IT Society are encouraged to nominate other eminent members in our field for this award. Please send nominations to the Awards Committee care of Joachim.Hagenauer@ei.tum.de.

IT Society Members Elected to Fellow in 2003

James Antonio Bucklew

for contributions to applications of signal quantization.

Tuvi Etzion

for contributions to error-correcting codes and digital sequences.

Thomas Edward Fuja

for contributions to error control coding.

Sanjeev R. Kulkarni

for contributions to machine learning, pattern recognition, and data compression.

Amos Lapidoth

for contributions to robust communications under channel uncertainty.

Hans-Andrea Loeliger

for contributions to group codes, iterative decoding and analog implementation of decoders.

Wojciech M. Szpankowski

for contributions to information system performance evaluation.

Zhen Zhang

for contributions to source coding theory and information inequities.

CRYPTARITHM for ISIT 2004

Elwyn Berlekamp

"Breakfast on June 28"
 703 - AM + CHICAGO/IL = ISIT04

Rules for decryption: Each of the ten different letters in this message consistently substitutes for a different one of the decimal digits from 0 to 9. Numbers (e.g. 703 and 04) stand for themselves. Only "CHICAGO" gets divided by "IL". When properly decrypted, the equation which results is mathematically correct. Moreover, the solution is unique.

IEEE Information Theory Society Board of Governors Meeting

Hotel des Grands Hommes

Paris, France

March 31, 2003

Aaron Gulliver

Attendees: John Anderson, Joseph Boutros, Paul Cotae, Vijay Bhargava, Tom Cover, Michelle Effros, Anthony Ephremides, Marc Fossorier, Tom Fuja, Andrea Goldsmith, Alex Grant, Aaron Gulliver, Joachim Hagenauer, Michael Honig, Hideki Imai, Torleiv Kløve, Ralf Koetter, Urbashi Mitra, Bixio Rimoldi, Shlomo Shamai, David Neuhoff, Alexander Vardy, Han Vinck. Raymond Yeung

1. The meeting was called to order at 8:15 PM by Society President Han Vinck. Those present were welcomed and introduced themselves. The Agenda was approved as distributed.
2. The minutes of the Board of Governors meeting held in Bangalore, India on October 21, 2002, were approved with amendments.
3. Society President Han Vinck thanked former President Tom Fuja for his efforts on behalf of the society during 2002. Aaron Gulliver was also thanked for his work as Board Secretary from 2000 to 2002. The appointment of Mehul Motani as the new Board Secretary was approved unanimously. Ubli Mitra was appointed Information Officer, the mandate being to provide continuity of information to the society executive as the officers rotate on a yearly basis. This support is particularly important for the Society Officers. Ivan Fair was appointed as Chair of the Education Committee, replacing Ezio Biglieri. Lance Perez was appointed Publications Officer, his primary mandate will be to explore electronic publications. Marc Fossorier agreed to continue as Treasurer for one more year, and a replacement will be sought for 2004.

The President then presented a report on the recent Technical Activities Board meeting, a major topic being IEEE finances. The Seidman report was presented, and the actions implemented by IEEE as a result were approved by TAB. The IEEE is still losing money, but the deficit for 2002 may be lower due to cost savings, in particular staff reductions. The Information Theory Society is on the IEEE watch list due to its financial situation.

The Swiss Winter School funded by profits from ISIT 2002 was a success with about 50 young European Ph.D. students in attendance. An Ad Hoc Committee on Survival was established to devise a balanced budget for 2004 and prepare a survival plan and options to be presented at the next board meeting. The committee consists of Han Vinck, Tom Fuja, Hideki Imai, Marc Fossorier and Steven McLaughlin. It will consider issues such as membership dues and Transactions charges and delivery. At present, most societies charge extra for Transactions.

4. Marc Fossorier presented the Treasurer's Report. He distributed an overview of the current financial status of the society, including a chart of the net worth of the society from 1996 to 2002 which shows that it has fallen to \$441,000.

IEEE charges for 2002 amounted to \$40,800 for infrastructure, \$159,900 for market fluctuation (unbudgeted losses in long term investments), \$50,000 for corporate recovery, \$73,000 for IP recovery and \$53,300 for TAB support (total \$377,000). For 2003, the charges total \$205,000 and for 2004 the total is \$215,000. This is virtually the society net worth and does not include possible investments losses. The society budget deficit is projected to be \$185,600 for 2003.

The losses due to market fluctuation charged to the society for 2002 of \$159,900 were levied without prior notice. This makes the task of balancing the budget difficult, as there was no warning of this IEEE action. The question of the society reaction was discussed, as well as the future society relationship with IEEE. Some felt the solution is more independence from IEEE, financial and otherwise. A main concern is the journal. Many members provide free labour to the journal as editors and reviewers, and this is not recognized by the IEEE as a contribution. The issue of being more proactive with the IEEE will be considered at the Annual Meeting, with the possibility of forming an ad hoc committee to further investigate the issue.

The financial status of recent and pending conferences was also presented. The \$6,000 approved at the last BOG meeting has been paid to the Swiss Winter School.

5. The report from the Balanced Budget Ad Hoc Committee was discussed next. It was determined that the budget shortfall is approximately \$180,000. Two options were put forward by the committee.
 - (a) Increase dues by \$30 for all members.
 - (b) Increase dues by \$30 for members requesting a paper version of the transactions, and keep the dues the same for members who request an electronic version.

The committee also recommended that a reserve fund be established as a contingency in case of unforeseen costs (such as those levied by IEEE) and conference shortfalls.

The production of a DVD containing the transactions, as well as page charges for the Transactions, were also discussed.

The issue of membership reductions due to the availability of the IEL was considered. At present the IEEE does not have any statistics or feedback available on this issue. For some, there may no longer be any incentive to join the Society. It was suggested that a fee structure be employed at symposia whereby IT Society members will pay a lower registration fee. In addition, the benefits should be more than financial,

i.e., the society should also strive to create in members a sense of belonging.

The following two motions were passed unanimously:

- (a) Membership dues will be \$60 for a p-membership (paper copies) and \$30 for an e-membership (electronic copies).
- (b) Symposium registration fees will be structured so that the amounts charged from highest to lowest are for IEEE non-members, IEEE members and IT Society members.

The President thanked the committee members for their efforts on behalf of the Society.

6. The Awards Committee Report was presented by Hideki Imai. The membership of the Awards Committee and the Joint IT/ComSoc Paper Award Committee were circulated. The Call for Nominations for the IT Society Paper Award will appear in the March Newsletter and is posted on the society website (ieeets.org). The deadline for nominations is May 2. The final list of nominees will be circulated to the BOG members by June 8. The Awards Committee will submit two papers to the Joint IT/ComSoc Paper Award Committee by April 15. The selection of the paper to receive the award will be made by May 15.
7. The Membership and Chapters Committee Report was discussed next. Membership is down 20% to 4095, while IEEE membership is down 18%, thus there is not a significant difference between the two. The first Best Chapter Award (2002) will be presented at ISIT 2003 in Yokohama. Steven McLaughlin is involved with IEEE research to develop a society membership survey which should help with member retention and providing better services to members.
8. The Newsletter Report by Editor Lance C. Pérez was considered next. The goal is to improve the technical content of the newsletter and in support of this, the membership is encouraged to submit articles for consideration. In addition, organizers of meetings of interest to members should send a picture along with a brief report to the editor. The newsletter archive is in place, it can be accessed at the same website as the Transactions (www.cparity.com/it/welcome/demo.html).
9. The Transactions Report by Editor-in-Chief Paul Siegel was distributed and discussed. The Transactions continues to have no backlog and to be mailed on time. An article for the March Newsletter has been prepared.

One new appointment to the Editorial Board was presented to the BOG for approval:

- (a) Source Coding: Tamas Linder replacing Ram Zamir, effective July 1, 2003.

The appointment was approved unanimously.

Two new Associate Editor positions (Coding Techniques and Communications) were also approved. The current editorial load is approximately 2-2.5 papers/month/AE, but in these two areas the load is consistently heavier.

There have been author complaints of delays of 1-2 years due to delinquent AEs and reviewers. It was suggested that AEs who continually neglect their duties be relieved of their position. In addition, persons submitting papers should expect to be called on to provide reviews.

Ultimately, it is the responsibility of the AEs to find reviewers. The BOG requested that the EIC discuss this issue with the Editorial Board and report back to the BOG.

The Board commended the EIC for his thorough report and excellent leadership of the Transactions.

10. The reports on Symposia and Workshops was presented by Committee Chair, Bixio Rimoldi. He noted that there are as yet no proposals for ISIT 2006, and a proposal is being developed for a workshop in St. Petersburg in 2006.
- 10.1 The Workshop held in Bangalore, India in October 2002 had 188 attendees, including 117 from India and 58 students. Due to the diligence of the organizers, a surplus of \$10,000 was generated. A motion was passed to grant \$5,000 to Bangalore, India Chapter for the promotion of IT activities when (and if) it is established.
- 10.2 The Paris Workshop currently underway has 142 attendees and 9 companions. This is a good total considering the current war in Iraq and the SARS outbreak. The budget was based on a total of only 120, so a modest surplus is forecast.
- 10.3 Hideki Imai reported on the progress of ISIT 2003, to be held in Yokohama, Japan. 494 papers have been received, and 125 rejected. Of note are the 12 papers from Australia and 11 papers from India, the sites of recent workshops. The President recently visited the symposium venue and was impressed with the facilities. The costs were discussed, including the registration fees. It was noted that several low cost hotels are located within walking distance of the Pacifico Yokohama.
- 10.4 Raymond Yeung presented a report on the Information Theory Workshop to be held in Hong Kong July 6-10, 2003. More than 80 papers have been submitted, acceptance will be announced on April 15. Andrew Yao, recipient of the 2000 Turing Award, has agreed to be the keynote speaker. A deposit of HK \$ 60,000 has been made to secure the venue.
- 10.5 An update on the 2004 Information Theory Symposium to be held in Chicago, IL, was circulated. The slate of plenary speakers is nearly complete, and the tutorial speakers have been chosen. In line with society requirements for a budget surplus, non-student registration fees have increased by \$25. It was noted that the new policy of lower registration fees for IT society members will have to be incorporated. The report also included detailed information on the venue, the organizing committee, social events, and costs for participants.
- 10.6 A workshop organized by Costas Georgiades is being planned for late 2004. A formal proposal will be presented at the Annual Meeting.
- 10.7 Alex Grant presented a report on ISIT 2005 to be held in

Adelaide, Australia. The Technical Program Chairs are currently selecting committee members. The convention centre has been booked, an official announcement should be made later this year. The budget has been designed to break even, and calls for an IEEE member early registration fee of AUD \$850. A motion to provide a loan of \$15,000 to the organizers was approved unanimously.

11. The Nominations Committee report provided the composition of the 2003 Awards Committee, 2003 Joint IT/ComSoc Paper Award Committee, and 2003 Fellows Committee.
12. The new Education Committee Chair, Ivan Fair, has been provided with a list of seven items to consider.
13. Aaron Gulliver presented the report on the IT society website. The new website developed by IEEE Entity Creation Services was successfully launched in January. Some minor bugs were reported by members, and these have been fixed. Although the design was excellent, the migration done by IEEE ECS required significant editing before it was suitable to go online.

A new feature of the website is the IT Forum, which should provide a good venue for discussing issues facing the society. The UCSD link for the Transactions vanished early this year causing some minor disruptions, but it has now been bypassed by linking directly to www.cparity.com. In addition, the domain name itsoc.org expired late in 2002, and was replaced by ieeets.org. This follows the convention of several other IEEE society websites. The volume of activity thus far in 2003 is approximately the same as in 2002.

14. Under other business, Andrea Goldsmith asked Board members to consider an update to the society TIP codes. These are the fields of interest of the members and provide valuable information to the society and IEEE.
15. The next board meeting will be held in Yokohama, Japan, on Sunday June 29, 10:00 AM, at the Hotel Pacifico Yokohama. The organizers of the workshop were thanked for making arrangements for the Board Meeting.
16. The meeting was adjourned at 9:45 PM.

IEEE Information Theory Society Board of Governors Meeting

Pacifico Conference Center

Yokohama, Japan

June 29, 2003

Mehul Motani

Attendees: John Anderson, Daniel Costello, Thomas Cover, Michelle Effros, Tony Ephremides, Ivan Fair, Tom Fuja, Marc Fossorier, Joachim Hagenauer, Chris Heegard, Hideki Imai, Torleiv Kløve, Ralf Koetter, Ioannis Kontoyiannis, Ryuji Kohno, Steven McLaughlin, Mehul Motani, Paul Siegel, David Tse, Alexendar Vardy, Han Vinck, Sriram Viswanath.

The meeting was called to order at 10:00 AM by Society President Han Vinck. The members of the Board were welcomed and introduced themselves.

1. The agenda was approved and distributed.
2. The minutes of the previous meeting in Paris, France on March 31, 2003 were approved as distributed.
3. The President began by reporting on the IEEE TAB meeting which was held earlier in the year. He reported that IEEE was very concerned about its financial situation. In 2002, IEEE suffered a \$16M deficit.

It was reported that due to redistribution of the IEL and ASPP income, the Society would be getting \$100K more based on content (the society has the largest journal offering) and downloading statistics. The Society will also be repaid 20% of the investment it has made in the digital library.

The President also reported that the Society was successful in participating in IEEE awards and suggested that more Society members be nominated for such awards.

4. The Awards Committee report was presented by Hideki Imai.

The Awards Committee has nominated Bob Gallager for the 2003 "Cristoforo Colombo" International Communications Award.

It was reported that the IT Society Members on the Joint IT/ComSoc Paper Award Committee and the chair of the IT Society Awards Committee selected one paper out of three nominations from members of the Awards Committee and submitted it to the Joint IT/ComSoc Paper Award Committee on April 16. There was no nomination from ComSoc. On June 18, the Joint IT/ComSoc Paper Award Committee decided to award the single nominated paper the Joint IT/ComSoc Best Paper Award. The winning paper is: S. Shamai (Shitz) and I. Sason, "Variations on the Gallager Bounds, Connections, and Applications," IEEE Transactions on Information Theory, Vol. 48, No. 12, pp. 3029-3051, December 2002.

Action Item It was agreed by the Board that the Joint IT/ComSoc Paper Award procedures be added to the Bylaws. This needs to be in conjunction with ComSoc.

It was reported that the total number of nominations for the IT Society Paper Award for the period 2001-2002 was 10. Three papers survived the last round of voting of the Award Committee:

- Lizhong Zheng and David N. C. Tse, "Communication on the Grassmann manifold: A geometric approach to the non-

coherent multiple-antenna channel", IEEE Transactions on Information Theory, vol. 48, no. 1 pp. 359 - 383, February 2002.

- Vladimir I. Levenshtein, "Efficient reconstruction of sequences," IEEE Transactions on Information Theory, vol. 47, no. 1, pp. 2-22, Jan. 2001.
- S. Verdu, "Spectral efficiency in the wideband regime," IEEE Transactions on Information Theory, special issue in memory of A. Wyner, on "Shannon theory: perspective, trends and applications", vol. 48, no. 6, pp. 1319-1343, June 2002.

According to the bylaws, the Board shall vote for the nominees by ballot, conducted by the Society President or designee, at the first Board Meeting following June 1st of the award year. The President informed the Board that several member of the Board could not attend the meeting due to visa problems. The Board voted unanimously to delay the vote and conduct an email ballot by August 1.

Action Item The Board voted unanimously to revisit the Bylaws with respect to voting for the IT Paper Award at the BOG meeting.

In an email ballot conducted in August 2003, the Board has selected the following paper for the IT Paper Award: Lizhong Zheng and David N. C. Tse, "Communication on the Grassmann manifold: A geometric approach to the noncoherent multiple-antenna channel", IEEE Trans. Info. Theory, vol. IT-48, pp. 359 - 383, February 2002.

5. The membership report was presented by Steven McLaughlin. He reported that the Society membership has dropped by 10% since last year (at the same time of the year). Since IEEE has seen a similar drop in its membership, it was suggested that this is the reason for the Society's drop. Steven also reported that the Society was participating in an IEEE wide questionnaire dealing with some membership issues.

Steven also noted that the Society chapter luncheon would be held on Thursday and invited any interested Board members to attend.

Action Item The Board requested that Steven report more details on the 10% drop in Society membership at the next Board meeting. Steven reported that there were 100 ISIT attendees who were not IT Society members and suggested contacting them regarding membership.

Action Item The Board requested that Steven, in cooperation with Michelle Effros, present a proposal at the next meeting addressing membership issues including ideas and suggestion for increasing Society membership.

6. The treasurer's report prepared by Marc Fossorier was distributed and discussed. The net worth (defined as total assets - deferred income) of the Society was \$541K.

Action Item It was noted that the finance figures for 2003 were not available from IEEE. The Board requested that Marc report the finances to the Board when the detailed figures are available.

7. There was nothing to report with respect to the IT Society Newsletter.

8. There was nothing to report with respect to the IT Society Website.

9. Matters related to Symposia and Workshops

- (a) The President reported on a request by IEEE-SA section to financially co-sponsor ISIT 2005 to be held in Adelaide, Australia. The Board voted unanimously not to accept financial co-sponsorship.

- (b) Tom Cover presented a proposal by Gadiel Seroussi and Andrea Goldsmith for ISIT 2006 in San Francisco. Tony Ephremides also noted that there was interest to hold ISIT 2006 in Seattle. The Board requested proposals with financial details from these two parties and will consider them at the next meeting.

- (c) Ryuji Kohno reported on ISIT 2003. Several issues, including the SARS situation, the technical program, financial aid, and budget, were discussed.

- (d) Dan Costello gave an update on ISIT 2004. He noted that the preparations were on schedule, the CFP has been distributed, and copies of the poster are to be displayed. He also noted that the registration fee has been raised to \$475. The 2004 symposium will be held June 27 - July 7, 2004 at the downtown Marriott in Chicago.

- (e) The 2004 ITW 2004 workshop to be held in San Antonio was discussed. The current proposal is to hold the workshop in October/November timeframe. It was suggested to hold the workshop in December instead, so as not to conflict with the Allerton conference. The matter will be discussed at the next meeting.

- (f) There was nothing new to report regarding ISIT 2005.

- (g) The Board approved technical co-sponsorship of ISITA 2004 to be held in Italy in October.

- (h) The matter of ISIT 2007 in Salzburg, Austria was discussed.

- (i) The Board approved technical co-sponsorship of WiOpt to be held in April 2004 in Cambridge.

- (j) It was suggested by the President that the Awards luncheon of the annual symposium be free for members of the IT Society only.

Action Item It was noted that the IEEE-SA section should be notified of the Board's decision not to accept financial co-sponsorship of ISIT 2005. It was also noted that ISITA 2004 and WiOpt organizers should be notified of the Board's positive decision on technical co-sponsorship.

10. The new CD-DVD initiative was discussed by Steven McLaughlin. The subject is the CD/DVD containing electronic copies of the IT Transactions. The main issue is whether the Society should aim to make money from the sale of the

CD/DVDs or should just give it away to all members. Two proposals arose from these discussions. The first is for the Society to update, produce and sell these CD/DVDs to interested parties. The second proposal, presented by Chris Heegard, is to give them free to all members and sell to others. Chris also requested that the CDs be updated with the papers published after 1998. It was noted that this will add to the benefits of IT Society membership and can be used as an incentive to encourage people to join the Society.

Action Item The Board requested Steven to study the CD-DVD initiative issue and present a proposal to the Board at the next meeting in October.

11. The Board unanimously approved the Distinguished Service Award, which was discussed at the previous Board meeting in October 2002.
12. A report on the Transactions on Information Theory was distributed by Paul Siegel, the Editor-in-Chief.

It was reported that the Transactions continue to have no backlog and this policy would be lifted only in certain circumstances

The Board approved the following editorial appointments:

Communications - Babak Hassibi (CalTech) , new position, effective August 1, 2003.

Coding Techniques - Oyvind Ytrehus (University of Bergen), new position, effective July 1, 2003.

Coding Techniques - Marc Fossorier (University of Hawaii at Manoa), replacing Rudiger Urbanke, effective October 1, 2003.

Coding Theory - Gilles Zemor (ENST), replacing Jorn Justesen, effective August 1, 2003.

Coding Theory - Bob McEliece (CalTech), replacing Ralf Koetter, effective September 1, 2003.

The issue of time to publication was discussed and a report, showing the average number of weeks from submission to publication for regular papers and correspondence articles published in issues of the Transactions from July 1998 to the present, was distributed.

With respect to the time to publication, the role of the associate editors (AE) was discussed. It was noted that promptness of the AE in handling papers was critical and that AE are currently sent reminders. It was also agreed that the Editor-in-Chief have the authority to remove an AE if necessary.

Electronic publishing issues were discussed and a report comparing electronic publishing software products, including ScholarOne's Manuscript Central was distributed.

The Board approved an ad hoc committee to look at publication issues, including improved notifications and acknowledgements to authors who have submitted manuscripts for publication. The committee members include Paul Siegel, Ralf

Koetter, John Anderson, Tony Ephremides, and Alex Vardy.

Action Item The Board requested that the ad-hoc committee looking at publications issues write a detailed task description and report at the next meeting in October.

13. Ivan Fair discussed the report of the education subcommittee. The President noted that members should lend their full support to the efforts of the education subcommittee. He suggested that anyone with input should email Ivan with their comments.

Action Item The Board requested that the Education committee present a more detailed report on their activities at the next meeting in October.

14. Joachim Hagenauer reported on the nominations for the Board. Six outgoing members have agreed to re-run. Six others have already been nominated. In addition, Alex Barg was nominated. The Board closed and unanimously approved these nominations for the Board.

The Board unanimously approved and closed the following nominations:

- Two nominations for 2nd Vice-president - Dave Neuhoff and Bixio Rimoldi.
- One nomination for 1st Vice-president - Steven McLaughlin
- One nomination for President - Hideki Imai

15. The floor was then opened up for all other business.

Chris Heegard raised an issue concerning the NSF that could have both good and bad implications for the Society. He noted that Julia Abrams, who handles most of the IT grant proposals, was leaving NSF. The IT Society should recruit someone to serve in NSF to protect the interests of Communications, Signal Processing and IT. He suggested that a group of IT Society members should go to Washington and discuss the matter with CISE.

The Board approved the formation of an ad hoc committee to liaison with NSF. The committee includes Chris Heegard, Tony Ephremides, Tom Fuja, Dave Forney, and Bruce Hajek.

Action Item The Board requested that the ad hoc committee tasked to liaison with the NSF report on their activities at the next meeting in October.

The President, Han Vinck, noted that IT Society Board members plan to meet with SITA, the Japanese IT Society, to have discussions and improve relations.

Action Item The Board requested that Han report the outcome of the SITA meeting at the next meeting in October.

16. The President announced that the next Board meeting will be held on October 1, 2003 at the Allerton conference. Further details will be provided at a later date.
17. The meeting was adjourned at 2:15 PM.

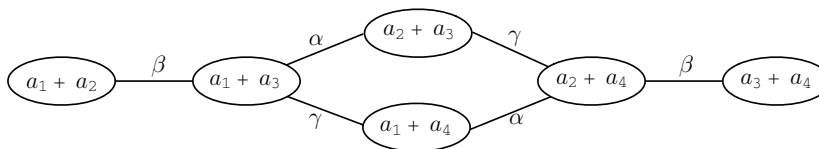
An Inverse Problem—Solutions

Solomon W. Golomb

We are asked to reconstruct a set S of n distinct positive real numbers, given only the set T consisting of the $\binom{n}{k}$ sums of the k -element subsets of S . Let the elements of S be $a_1 < a_2 < a_3 < \dots < a_n$. Each a_i occurs in exactly $\binom{n-1}{k-1}$ of the k -element subsets of S . Hence, the sum, $a_1 + a_2 + \dots + a_n$, of all the elements of S can be obtained by summing all $\binom{n}{k}$ elements of T and then dividing by $\binom{n-1}{k-1}$.

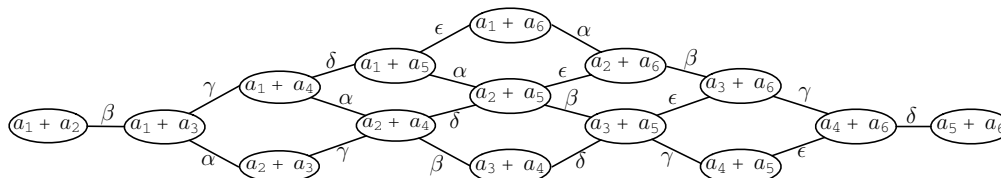
If $n > k$, the *smallest* element of T is $a_1 + a_2 + \dots + a_k$, and the *next-smallest* element of T is $a_1 + a_2 + \dots + a_{k-1} + a_{k+1}$. Similarly, the *largest* element of T is $a_n + a_{n-1} + \dots + a_{n-k+1}$, and the *next-largest* element of T is $a_n + a_{n-1} + \dots + a_{n-k+2} + a_{n-k}$. The remaining elements of T are partially ordered by magnitude. This partial ordering can usefully be shown by a graph, where the nodes are the elements of T (increasing in numerical magnitude from left to right), and the edges are labeled with the difference of the magnitudes of the nodes they connect. The only distinct edge labels will be $\alpha = a_2 - a_1$, $\beta = a_3 - a_2$, $\gamma = a_4 - a_3$, etc. These facts, and the corresponding graphs, will be used to solve problems 1 to 4 as follows.

1. $n = 4, k = 2, T = \{24, 28, 30, 32, 34, 38\}$.

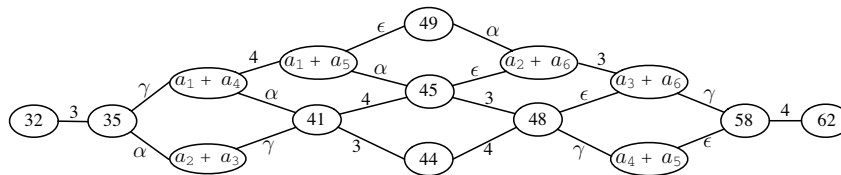


We know $a_1 + a_2 = 24$, $a_1 + a_3 = 28$, $a_2 + a_4 = 34$, $a_3 + a_4 = 38$, and $\beta = a_3 - a_2 = 4$. There are two possibilities, leading to two solutions. Either $a_2 + a_3 = 30$ and $a_1 + a_4 = 32$, or $a_2 + a_3 = 32$ and $a_1 + a_4 = 30$. In the former case $\alpha = 2$, $\gamma = 4$, while in the latter case $\alpha = 4$, $\gamma = 2$. In the former case, $a_3 + a_2 = 30$, $a_3 - a_2 = \beta = 4$, and $a_3 = 17$, giving $a_2 = 13$, $a_1 = 11$, and $a_4 = 21$. That is, a first solution is $S = \{11, 13, 17, 21\}$. In the latter case, $a_3 + a_2 = 32$, $a_3 - a_2 = \beta = 4$, and $a_3 = 18$, from which $a_2 = 14$, $a_1 = 10$, and $a_4 = 20$. That is, the second solution is $S = \{10, 14, 18, 20\}$.

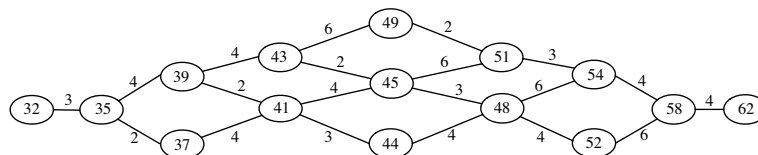
2. $n = 5, k = 2, T = \{21, 26, 28, 29, 31, 34, 36, 37, 42, 44\}$. With $S = \{a_1, a_2, a_3, a_4, a_5\}$ with $a_1 < a_2 < a_3 < a_4 < a_5$, we have $a_1 + a_2 + a_3 + a_4 + a_5 = 328/4 = 82$, where 328 is the sum of the elements in T , and $4 = \binom{5-1}{2-1}$. We know $a_1 + a_2 = 21$, $a_1 + a_3 = 26$, $a_5 + a_4 = 44$, and $a_5 + a_3 = 42$. Also, $a_3 = 82 - (a_1 + a_2) - (a_4 + a_5) = 82 - 21 - 44 = 17$. Then $a_1 = 26 - 17 = 9$ and $a_5 = 42 - 17 = 25$. Finally, $a_2 = 21 - 9 = 12$, and $a_4 = 44 - 25 = 19$. Hence the unique solution is $S = \{9, 12, 17, 19, 25\}$.
3. $n = 6, k = 2, T = \{32, 35, 37, 39, 41, 43, 44, 45, 48, 49, 51, 52, 54, 58, 62\}$. Here the graph is



We know $a_1 + a_2 = 32$, $a_1 + a_3 = 35$, $\beta = 3$, $a_5 + a_6 = 62$, $a_4 + a_6 = 58$, $\delta = 4$. Also, $a_1 + a_2 + a_3 + a_4 + a_5 + a_6 = 690/5 = 138$, from which $a_3 + a_4 = 138 - (a_1 + a_2) - (a_5 + a_6) = 138 - 32 - 62 = 44$; $a_2 + a_5 = 138 - (a_1 + a_3) - (a_4 + a_6) = 138 - 35 - 58 = 45$, and $a_1 + a_6 = 138 - (a_2 + a_5) - (a_3 + a_4) = 138 - 45 - 44 = 49$. Our graph now becomes

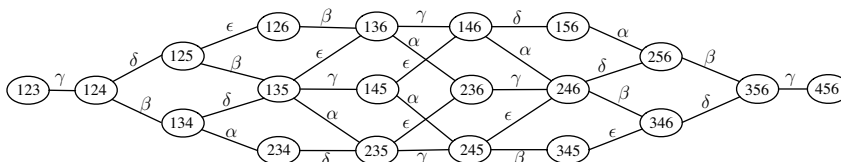


From nodes 35 to 41, $\alpha + \gamma = 6$. From nodes 48 to 58, $\gamma + \epsilon = 10$. From nodes 45 to 49, $-\alpha + \epsilon = 4$. (This is a dependent set of 3 equations, so we do not yet have a unique solution.) The third-smallest element of T , 37, is either $a_1 + a_4$ or $a_2 + a_3$, so either $\gamma = 2$ or $\alpha = 2$. The third-largest element of T , 54, is either $a_3 + a_6$ or $a_4 + a_5$, so either $\gamma = 4$ or $\epsilon = 4$. From the last two statements, there are three possibilities: i) $\gamma = 2, \epsilon = 4$; ii) $\alpha = 2, \gamma = 4$; iii) $\alpha = 2, \epsilon = 4$. Since $\gamma + \epsilon = 10$ we rule out i). Since $-\alpha + \epsilon = 4$ we rule out iii). That leaves only ii), with $\alpha + \gamma = 2 + 4 = 6$. We can now uniquely fill in the entire graph.



Knowing which two elements of S were summed to obtain each element of T , we have 15 consistent linear equations in only 6 unknowns. One easy way to solve this system: $a_3 - a_2 = \beta = 3, a_3 + a_2 = 37$, hence $a_3 = 20, a_2 = 17$, and $a_1 = 32 - 17 = 15$. Also $a_5 - a_4 = \delta = 4, a_5 + a_4 = 52, a_5 = 28$, hence $a_4 = 24$, and $a_6 = 62 - 28 = 34$. Thus, the unique solution is $S = \{15, 17, 20, 24, 28, 34\}$.

- $n = 6, k = 3, T = \{49, 54, 56, 57, 58, 60, 61, 65, 66, 67, 68, 69, 70, 74, 75, 77, 78, 79, 81, 86\}$. We have $a_1 + a_2 + a_3 = 49, a_1 + a_2 + a_4 = 54, a_6 + a_5 + a_4 = 86, a_6 + a_5 + a_3 = 81$. Thus $a_1 + a_2 + a_3 + a_4 + a_5 + a_6 = 135$, and $a_4 - a_3 = \gamma = 5$. The graph, using only the subscripts of the summed a_i 's to label the nodes, shows its central symmetry, and in fact it has the V_4 symmetry group of the rectangle.



It is relatively easy to show that there are only two sets of six positive real numbers for which the sums of all 3-subsets yield the twenty elements of T . One is $S_1 = \{15, 16, 18, 23, 27, 36\}$, and the other is $S_2 = \{9, 18, 22, 27, 29, 30\}$. These correspond to two mirror-image assignments to the edges of the graph. S_1 uses $\alpha = 1, \beta = 2, \gamma = 5, \delta = 4, \epsilon = 9$, while S_2 uses the reverse assignment $\alpha = 9, \beta = 4, \gamma = 5, \delta = 2, \epsilon = 1$.

- If $k' = n - k$, the k' -subsets of $S = \{a_1, a_2, \dots, a_n\}$ are precisely the *complements* (relative to S) of the k -subsets. Since we showed how to obtain the sum τ of all elements in S (by dividing the sum of all elements of T by $\binom{n-1}{k-1}$), if we replace the elements of T by τ minus each of these elements to obtain T' , we see the equivalence of the two problems.
- For $n = k = 2$, we have $S = \{a_1, a_2\}$ and $T = \{a_1 + a_2\}$. From the single positive element in T , there are infinitely many ways (a continuum of ways) to represent it as a sum of two elements. For $n = 3, k = 2$, we have $S = \{a_1, a_2, a_3\}$ and $T = \{a_1 + a_2, a_1 + a_3, a_2 + a_3\}$. If $a_1 < a_2 < a_3$ then $a_1 + a_2 < a_1 + a_3 < a_2 + a_3$, so if we are given $T = \{r, s, t\}$ with $r < s < t$, then we have a solvable system of three linear equations in three unknowns, with a unique solution. We saw in Problem 1 that the case $n = 4, k = 2$, has *two* solutions for S , while in Problems 2 and 3 we saw that $n = 5, k = 2$, and $n = 6, k = 2$, have unique solutions. For $k = 2$ and $n > 4$ the reconstruction of S from T is unique.
- If $n = k > 1$, then S contains at least two elements while T contains only one (the sum of all elements of S), and as in the case $n = k = 2$, there are infinitely many solutions.
- For $k \geq 2$ and $n = 2k$ there will be two solutions for S , given T . This is the case where $k' = k$ (in Problem 5), and the graph has V_4 symmetry, whereby each solution has a complementary solution. (In Problems 1 and 4, we saw the special cases $n = 4, k = 2$, and $n = 6, k = 3$.)

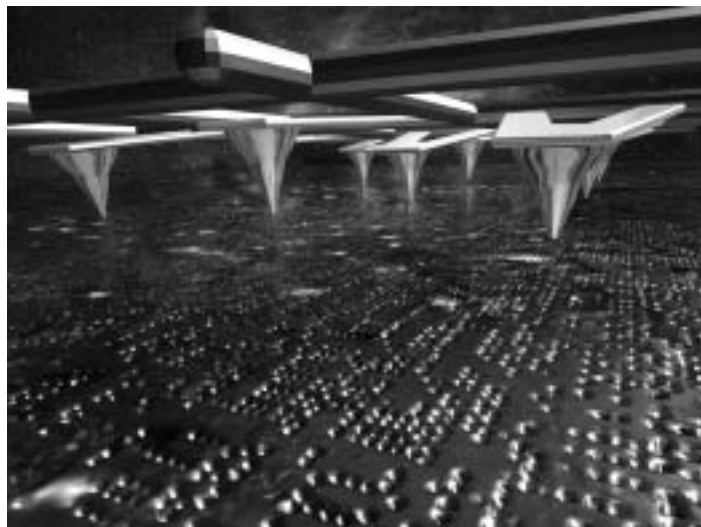
DIMACS Working Group & Workshop on Advances in Information Recording

March 22-24, 2004 & March 25-26, 2004

Piscataway, NJ

by Paul Siegel, Emina Soljanin, Adriaan van Wijngaarden and Bane Vasic

A working group and a workshop on Information Recording were held from Monday, March 22, to Friday, March 26, at the Center for Discrete Mathematics and Theoretical Computer Science (DIMACS) located at Rutgers University, Piscataway, New Jersey. Both events were organized by Paul Siegel (UCSD), Emina Soljanin (Bell Laboratories), Adriaan van Wijngaarden (Bell Laboratories) and Bane Vasic (University of Arizona at Tucson), and were part of a series of workshops being organized under the auspices of the "DIMACS 2001-2004 Special Focus on Computational Information Theory and Coding", which is a program funded by the National Science Foundation.



IBM's probe-storage system

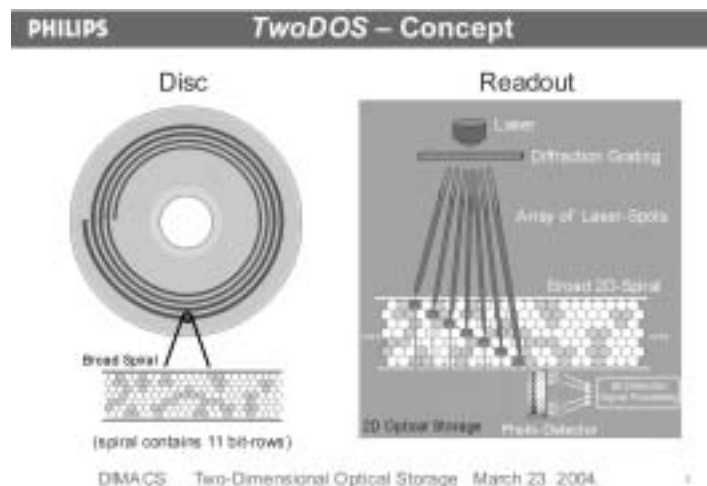
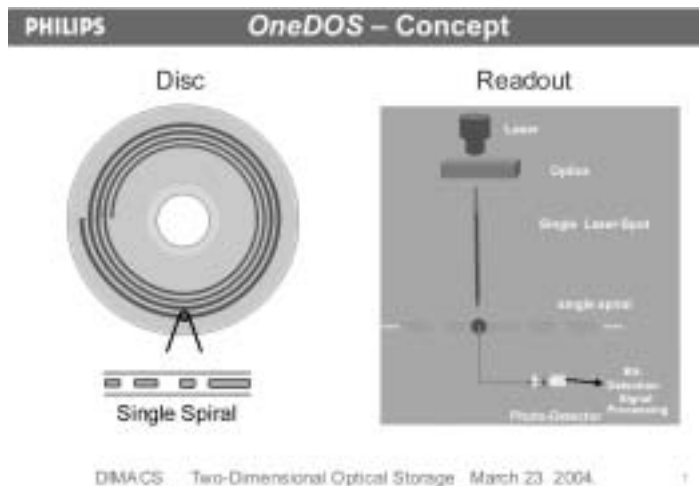
more storage capacity and faster access will further drive the development of even more sophisticated storage systems and new materials. Further advances in physics, chemistry and biology may provide new possibilities to further push the limits. Information theory will continue to play an important role in identifying principles unique to both natural and artificial storage systems and in building a model and framework for storage in these new materials. These principles are, as noted by Matt Ridley in "Genome", as old as the time "when life divided the labour between two separate activities: chemical work and information storage, metabolism and replication". Efforts to better

The focus of the working group and the workshop was on advances in information recording. This field has witnessed tremendous increases in recording densities and data rates in man-made recording systems during the last twenty years, and steady progress is being made in the search for new materials and techniques for information storage and retrieval. The continuing strong demands for

understand and mathematically formulate these mechanisms will offer new directions in information and coding theory. It will also motivate a review of existing storage system models and coding and detection methodologies, which, in turn, can provide improvements to new and existing systems as well.

In this context, the objective of the working group and workshop were to bring together experts on information storage from a

continued on page 18



A new multi-track data format of a prototype of the Blue-ray DVD currently being developed by Philips.



CALL FOR PAPERS

2004 IEEE Information Theory Workshop

Marriot Riverwalk, San Antonio, Texas
October 24-29, 2004



General Co-Chairs:
Costas N. Georgiades
Sergio Verdú

Program Committee:
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Naofal Al Dhahir
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Michael Fitz
Andrea Goldsmith
Te Sun Han
Robert Heath
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Muriel Medard
Urbashi Mitra
Michael Orchard
Alon Orlitsky (co-chair)
Kennan Ramachandran
Bixio Rimoldi
Serap Savari
Gadiel Seroussi
Emina Soljanin
Martin Strauss
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Krishna Narayanan

Web and Publicity:
Deepa Kundur

Local Arrangements:
Paul Cotae
Sonny Matous

Administration:
Sonny Matous

The 2004 IEEE Information Theory Workshop (ITW 2004) will take place on October 24-29 in San Antonio, Texas, USA. All areas of information theory will be represented, with special emphasis on new applications of information theory within biology, computer science, and networking. Technical sessions will include:

- Emerging Applications of Information Theory
- Information Theory and Computer Science
- Information Theory and Networks
- Wireless Systems and Space-Time Signal Processing
- Source and Channel Coding Techniques
- Data Compression
- Graphs, Codes and Iterative Decoding
- Algebraic Codes, Cryptography and Cryptanalysis

Contributions by authors new to the information theory community are particularly encouraged. Abstracts of up to 5 pages should be submitted electronically to itw2004@ee.tamu.edu by **May 31, 2004** following the guidelines on the workshop web page. Authors will be notified of acceptance decisions by **July 16, 2004**. The final version, to be published in the workshop proceedings, will be due by **September 3, 2004**. Information on the final manuscript format can be found on the workshop web page. Those unable to submit manuscripts electronically should send two copies of the manuscript by the deadline to:

Costas N. Georgiades
c/o Ms. Sonny Matous
Electrical Engineering Department
Texas A&M University
College Station, Texas 77843-3128
USA

Information regarding the technical and social programs, final manuscript format, workshop registration, and hotel accommodations will be posted on the workshop website at:

<http://ee-wcl.tamu.edu/itw2004/>

Inquiries on general matters related to the workshop should be addressed to:

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College Station, TX 77843-3128
Email: sonny@ee.tamu.edu
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Fax: 979-862-4630

Call for Papers

9th International OFDM-Workshop 2004 (InOWo'04)

15.-16. September 2004
Hotel Hilton, Dresden, Germany

The 9th International OFDM-Workshop (InOWo'04) will be held the first time in Dresden, Germany, from Wednesday, 15. September through Thursday, 16. September 2004. The Workshop provides an opportunity for international researchers interested in all aspects of the OFDM transmission technique to meet and discuss current results of their research work. In addition to the two day conference a half-day tutorial on various aspects of the OFDM transmission technique is planned for the 14. September 2004.

Paper submissions for technical sessions may cover all aspects of multi-carrier transmission including any of the following areas (but not limited to):

Signal Processing in OFDM Systems:

- Modulation Techniques
- Equalisation and Synchronisation
- Channel Coding
- Non-Linearities
- Multiple Access Techniques

OFDM System Concepts:

- Crosslayer Optimisation
- 4th Generation Networks
- Hiperlan/2 and IEEE 802.11a
- DLC-Protocol Issues
- Ad-Hoc Networking
- XDSL

MIMO with OFDM:

- Antenna Techniques
- MIMO Coding
- Multi User Systems and MIMO

Experimental Systems and Field Trials:

- Implementation Issues
- VLSI Architectures
- Software Defined Radio for OFDM

Authors are invited to submit a one-page extended abstract, including the authors' full contact information, to the Workshop e-mail address ofdm@tu-harburg.de.

Important Dates

Deadline for Extended Abstracts:	April 30, 2004
Notification of Acceptance:	June 18, 2004
Early Registration:	August 6, 2004
Final Papers Due:	August 6, 2004

For further information about this Workshop, as well as detailed instruction for submitting the final paper, please visit our web page at:

<http://ofdm.tu-harburg.de/>

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<http://ofdm.tu-harburg.de>

Forty-Second Annual Allerton Conference on Communication, Control, and Computing

September 29 – October 1, 2004



The Forty-Second Annual Allerton Conference on Communication, Control, and Computing will be held from Wednesday, September 29 through Friday, October 1, 2004, at the Allerton House, the conference center of the University of Illinois. Allerton House is located twenty-six miles southwest of the Urbana-Champaign campus of the University, in a wooded area on the Sangamon River. It is part of the fifteen-hundred acre Robert Allerton Park, a complex of natural and man-made beauty designated as a National natural landmark. The Allerton Park has twenty miles of well-maintained trails and a living gallery of formal gardens, studded with sculptures collected from around the world.

Papers presenting original research are solicited in the areas of communication systems, communication and computer networks, detection and estimation theory, information theory, error control coding, source coding and data compression, queueing networks, control systems, robust and nonlinear control, adaptive control, optimization, dynamic games, large scale systems, robotics and automation, manufacturing systems, discrete event systems, intelligent control, multivariable control, computer vision based control, learning theory, neural networks, VLSI architectures for communications and signal processing, and automated highway systems. Also solicited are organized sessions for the Conference; prospective organizers should discuss their plans with the Conference co-chairs before sending a formal proposal.

Plenary lecture: Professor Bernd Sturmfels of the University of California, Berkeley will deliver this year's plenary lecture. It is entitled "The Tropical Geometry of Statistics Models" and is scheduled for Friday, October 1, 2004.

Information for authors: Regular papers, suitable for presentation in twenty minutes, as well as short papers, suitable for presentation in ten minutes, are solicited. The purpose of the short paper

category is to encourage authors to present preliminary results of their work. Regular papers will be published in full (subject to a maximum length of ten 8.5" x 11" pages) in the Conference Proceedings, while short papers will be limited to two-page summaries in the Proceedings.

For reviewing purposes regular papers, a title and a five-to-ten page extended abstract, including references and sufficient detail to permit careful reviewing, are required. For short papers, a title and a three-to-five page summary are required. Manuscripts that are submitted as regular papers but cannot be accommodated in that category will be considered in the short paper category, unless the authors indicate otherwise.

Manuscripts must be submitted by Thursday, July 1, 2004 following the instructions at the Conference website: <http://www.comm.csl.uiuc.edu/allerton>.

Authors will be notified of acceptance via e-mail by August 8, 2004, at which time they will also be sent detailed instructions for the preparation of their papers for the Proceedings.

A final version of presented papers must be submitted electronically prior to the end of the Conference.

Conference Co-Chairs: Venu Veeravalli and Geir Dullerud

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CALL FOR PAPERS

2005 IEEE International Symposium on Information Theory

Adelaide Convention Centre, Adelaide, Australia
September 4 – 9, 2005



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The 2005 IEEE International Symposium on Information Theory will be held at the Adelaide Convention Centre in Adelaide, Australia from Sunday, September 4 through Friday September 9, 2005.

Previously unpublished contributions to the following areas will be solicited:

Coded modulation	Information theory and statistics
Coding theory and practice	Multiuser detection
Communication complexity	Multiuser information theory
Communication systems	Pattern recognition and learning
Cryptography and data security	Quantum information processing
Data compression	Shannon theory
Data networks	Signal processing
Detection and estimation	Source coding

Papers will be reviewed on the basis of an extended abstract (not exceeding six pages) of sufficient detail to permit reasonable evaluation. The deadline for submission is **January 30, 2005**, with notification of decisions by May 15, 2005. The deadline will be strictly enforced. In view of the large number of submissions expected, multiple submissions by the same author will receive especially stringent scrutiny. All accepted papers will be allowed twenty minutes for presentation, and one-page abstracts will be printed in the conference proceedings. Authors are strongly encouraged to submit electronic versions of their extended abstracts in the form of Portable Document Format (PDF) files.

Detailed information on paper submission, technical program, accommodation, travel, and excursions will be posted on the Symposium web site

<http://www.isit2005.org>

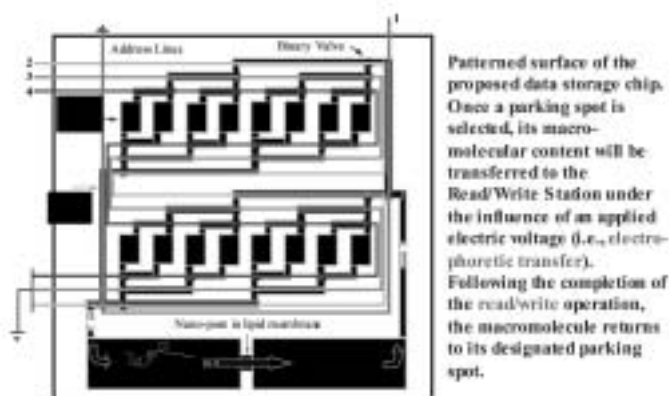
Inquiries on general matters related to the Symposium should be directed to

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DNA Storage Chip



A DNA storage chip

range of different fields. In order to facilitate a synthesis of ideas, the three-day working group consisted of 11 invited one-hour

presentations with plenty of time for informal discussions. The working group started off with presentations on macro-molecular data storage, genetic information and efficient DNA storage. The next two days were devoted to new advances in one- and two-dimensional constraints and storage systems, capacity results, and iterative timing recovery.

The two-day workshop consisted of 10 invited presentations on recent advances in constrained systems, timing recovery, capacity results and error control coding.

More information on the working group and the workshop can be found at http://dimacs.rutgers.edu/Workshops/Storage_WG/ and <http://dimacs.rutgers.edu/Workshops/Storage>. The view-graphs of the presentations are available at <http://cm.bell-labs.com/cm/ms/events/WGIR04> and <http://cm.bell-labs.com/cm/ms/events/WSIR04>, respectively. Proceedings of the workshop will be published as part of the American Mathematical Society (AMS) DIMACS Volumes, and will appear during the course of next year.

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Conference Calendar

DATE	CONFERENCE	LOCATION	CONTACT/INFORMATION	DUE DATE
June 27 - July 2, 2004	2004 IEEE International Symposium on Information Theory (ISIT)	Chicago Downtown Marriot Chicago, Illinois, USA	chair@isit2004.org http://www.isit2004.org	Dec. 1, 2003
June 20-24, 2004	2004 International Conference on Communications (ICC)	Paris, France	http://www.icc2004.org	Sept. 1, 2003
July 19-24, 2004	2004 Stochastic Networks Conference	Centre de Recherches Mathematiques Universite de Montreal Montreal, Canada	http://www.stanford.edu/group/stochnetconf/	
September 15-16, 2004	InOWo '04 - 9th International OFDM Workshop	Dresden, Germany	See CFP in this issue. http://ofdm.tu-harburg.de Prof. Herman Rohling, TU Hamburg-Harburg, Eissendorfer Str. 40, D-21073 Hamburg, Germany, ofdm@tu-harburg.de	April 30, 2004
September 29- October 1, 2004	42nd Annual Allerton Conference on Communication, Control and Computing	Monticello, IL	See CFP in this issue. http://www.comm.csl.uiuc.edu/allerton	July 1, 2004
October 6-8, 2004	2004 Asia-Europe Workshop on Information Theory (AEW4)	Viareggio, Italy	http://www.exp-math.uni-essen.de/~vinck/aew4/aew4.html	May 1, 2004
October 10-12, 2004	2004 International Symposium on Information Theory and its Applications (ISITA 2004)	Parma, Italy	isita2004@sita.gr.jp http://www.sita.gr.jp/ISITA2004/new.htm	March 26, 2004
October 24-29, 2004	2004 IEEE Information Theory Workshop (ITW)	San Antonio Marriot Riverwalk Hotel San Antonio, Texas, USA	See CFP in this issue. http://ee-wcl.tamu.edu/itw2004 Ms. Sonny Matous Electrical Engineering Department Texas A&M University Room 237 WERC	May 31, 2004
November 29- December 3, 2004	GLOBECOM 2004	Hyatt Regency Dallas at Reunion Hotel Dallas, Texas, USA	http://www.globecom2004.org	March 1, 2004
TBA (before ISIT 2005)	2005 Information Theory Workshop (ITW)	New Zealand	TBA	TBA
September 4-9, 2005	2005 IEEE International Symposium on Information Theory (ISIT)	Adelaide Convention Center Adelaide, AUSTRALIA	See CFP in this issue. http://www.isit2005.org Dr. Alex Grant Institute for Telecommunications Research University of South Australia SA 5095 Australia Prof. Rodney A. Kennedy Research School of Information Sciences and Engineering Australian National University ACT 0200 Australia rodney.kennedy@anu.edu.au	January 30, 2005
TBA	2006 IEEE International Symposium on Information Theory (ISIT)	Seattle, Washington, USA	TBA	TBA

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