IEEE Information Theory Society Newsletter

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President's Column

Steven W. McLaughlin

Steven W. McLaughlin

Having been involved in activities for IEEE for about fifteen years, there are several things that clearly stand out about our Society. We are unique in that our Society was founded by, and revolves around, a single paper. We are equally unique in the community that this has created: a modest-sized group of researchers (our membership is about 3000 people) who are friendly and close knit, but distributed worldwide (more than 60% of our members are outside the US). Common to us all is a great affection for (dare I say love of?) information theory; where the environment is supportive – success in and advancement of information theory comes with the genuine support of the whole community. While this might seem natural to many, I find it almost exclusively within IEEE.

One of the consistent themes at Board of Governors meetings and in individual conversation is the need to get new and different people involved. The most common comment is that too often, we see and hear from the same people in the Society. So please accept this appeal to become involved – think about organizing a workshop, come to the BoG meeting, volunteer your services as a Transactions reviewer, get involved in your local IT Chapter (there are more than 25 worldwide) or start your own! If you contact me directly, I can assure you that we will find a way to get you involved.

IT Society Student Committee

Our Society has a new initiative that I want to make you aware of and to ask your help in supporting. There are many students that are enthusiastic about information theory and the Society is very interested in hearing more from them. We have recently formed an IT Society Student Committee that is charged with establishing new programs, ideas, and initiatives for, and led by, students. Professor Andrea Goldsmith is chairing this committee that will be composed entirely of students. Our goal is to have the first meeting and set of ideas to present at the BoG meeting in Adelaide in September this year. If you are a student or an advisor of students who wants to get involved, the committee is open to any student who would like to participate. Please contact either Andrea (andrea@systems.stanford.edu) or me (swm@ece.gatech.edu) and we will add you to the committee.

The Changing Role of the Technical Societies within IEEE

We continue our evolution towards more electronic publication. IEEE Explore is reasonably mature, and there are now a host of useful statistics about its use. Starting this year some of these statistics will be used to determine a very large percentage of our income. Essentially, the more our publications are accessed on Explore, the more income we get. I am happy to report that our Transactions is the fourth most widely visited publication in Explore (this includes more than 1000 journals, magazines and conference publications). We have always known that even though we are a small Society, our impact is large. To counter this, our Society has decreased significantly – from about 5800 members in 2001 to 3300 today. The contradiction is that information theory is growing and very much alive and well (look at the size of your Transactions and the number of people and papers at ISIT).

I recently spent a day at IEEE Headquarters trying to better understand this and to try and develop a strategy to deal with it. What I learned surprised me. It has always been the case that Society membership contributes a relatively small percentage of the total income of the Society - about 10%. With electronic access to our papers on IEEE Electronic Library (IEL) and IEEE Explore, many people are able to get free online access to our publications through their employers – there is no need for them to join our Society. This coupled with the recent downturn in the global economy caused many people to drop society memberships. Some within IEEE believe that most of these members are not coming back. So while we think that the number of members reflects the general health and viability of a technical society, this may not be the case now or in the future. Perhaps the function of small societies like ours is to serve as a reservoir for volunteers for the transactions and conferences, but not much else. The future financial health of our Society is now, more than ever, directly connected to the relevance of our work, not only to our Society, but also to the much larger scientific and engineering community. This is our strength and positions us well for the future.

From the Editor

Lance C. Pérez

The June 2005 issue of the IEEE Information Theory Society Newsletter once again honors the passing of a distinguished member of the IT Community. A brief memorial to Professor Dr.-Ing. Bernhard Dorsch by Martin Bossert and Joachim Hagenauer appears on the opposite page.

This issue also features the Historian's Column, President's Column and Golomb's Puzzle Column. The Historian's column is of particular interest as it is accompanied by several historical photographs. On page 6, we have another article concerning the arXiv preprint server. For those unfamiliar with arXiv, it has been the topic of several articles and columns in the past few issues of the Newsletter. The March 2005 issue is particularly informative on this subject.

Please help make the Newsletter as interesting and informative as possible by offering suggestions and contributing news. The deadlines for the 2005 issues of the Newsletter are as follows:

Issue	Deadline
September 2005	July 15, 2005
December 2005	October 15, 2005

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

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In Memoriam: Bernhard Dorsch

Martin Bossert, Ulm
Joachim Hagenauer, München

Professor Dr.-Ing. Bernhard Dorsch from Darmstadt, Germany passed away on July 2nd, 2004 after a long and severe illness. He started his career at the German Aerospace Research (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt) also known as DFVLR and later DLR in Oberpfaffenhofen. During his time at DLR he held visiting positions at the NASA Ames Research Center and at the Goddard Space Flight Center in Greenbelt, Maryland. His advanced concatenated error-correcting scheme flew on the Mars-Mariner spacecraft in 1971 and is documented in his paper "Error control coding using a concatenated code". His widely cited paper about soft decoding of block codes "A decoding algorithm for binary block codes and J-ary output channels", which appeared in the May 1974 issue of the IEEE Transactions on Information Theory attacked a subject which is still interesting today.

In 1982 Bernhard Dorsch was appointed to a chaired professorship at the Technical University Darmstadt where he was engaged in teaching courses on the fundamentals of electrical engineering, coding and information theory. His research resulted in some twenty-five doctoral dissertations. His institute was always open to visitors, especially for Soviet and Russian scientists at a time when such contacts were not so easy. He and his wife Renate were perfect hosts for those guests at their beautiful home in Landsberg, Bavaria. Professor Dorsch was one of the first researchers in the seventies in Germany to be active in the areas of coding and information theory. As the co-chair of the 1997 International Symposium on Information Theory in Ulm he once again provided leadership to this field in his home country and worldwide. Bernhard will be missed by his family, friends, colleagues and students.

The Historian's Column

A. Ephremides

Today we have a visual treat for our readers. And it is real history. Duly recorded by Bob Gray, who hereby becomes yet another historian-par-excellence. These are pictures from the distant past, distant, that is, by Information Theory history standards. Many of you will only recognize one or two of those shown in the pictures. Many others, I'm sure, will marvel at the youthfulness of those they know and who, by now, have turned into "graybeard" elders of the Society. And some of course have left us forever.

Let us see. In the first picture we see the Founder of our field in an unusual, jolly occasion. Claude Shannon is in the middle and to the left (his right) we see Lee Davisson (who looks like a teenager, if not younger) and Dave Forney (who still looks like this, except, as we know, he has added some gray hairs to accent his wisdom). To the right (Shannon's left) we see Giuseppe Longo and his wife of that time. To many, I am sure, Lee and Giuseppe are not too familiar. Well, Lee was one of the pioneers of universal source coding, winner of the IT best paper award, President of our Society, chairman of my department in the late '80's, founder of a successful company, and, currently, sailing around the globe in his beautiful sailboat for the last five years or so. And Giuseppe Longo was one of the first active European Information Theorists who marked our field in the seventies. He was the general chair for the 1979 IT Symposium in Grignano, Italy (where Lee Davisson was actually his co-chair). And how did these people get together with Shannon? Well, this picture dates from June 1973 and it was shot in Ashkelon, Israel, during the ISIT there. Those who read scrupulously my columns will know that Shannon was the first, --- well, Shannon Lecturer at that Symposium. Notice how Claude shyly conceals a glass of wine.

Claude Shannon and others at the 1973 ISIT in Ashkelon, Israel.

Claude Shannon and others at the 1973 ISIT in Ashkelon, Israel.

Bob Gray and A.M. Yaglom in Moscow in 1975.

Bob Gray and John Anderson joining Bob Gallager and his wife in St. Jovite, Quebec, in 1983

The second picture is from the same time and place. Except it shows some stalwarts of our field engaged in animated scientific debate. Yes, the one on the extreme left is none other than Tom Cover, who, as we see, is sporting a cigarette. Next to Shannon we see Fred Jelinek (he really has not changed much), Ted Kadota, an unidentified individual (appeal to the readers: anyone who recognizes who it is, please let us know), and at the extreme right we see Mike Pursley. The person with his back to the lens is also unidentified. Again, anyone who recognizes or remembers who that individual is, please let us know (for History's sake). Although Fred is not often seen at our Symposia lately, for those who do not know him, he is directing a speech processing laboratory at Johns Hopkins University and has been one of the most active and vocal Presidents of our Society who never hesitated to call a spade, "a spade". Of course, who doesn't know Tom Cover and Mike Pursley? But I am sure many do not recognize Ted Kadota. He is now retired in Hawaii after a long career at Bell Labs at Murray Hill. He was one of the main members of the famous mathematics group headed first by Dave Slepian, then by Aaron Wyner, and that included many luminaries of our field.

The third picture shows Bob Gray himself with A.M. Yaglom, one of the most well-known Russian mathematicians in the field of Probability and Stochastic Processes. This picture is from the famous (or, by now, "infamous") workshop in Moscow in December 1975.

And finally, a more recent photo (about one decade later but still more than twenty years ago) from the ISIT in St. Jovite, Quebec, in 1983. We see again Bob Gray, John Anderson (he, too, has changed little, mostly by adding some silver to his hair), joining Bob Gallager and his wife. Bob was the Shannon Lecturer at that ISIT and the background shows the beautiful lake near which the Symposium took place.

Thanks to Bob Gray, again, for sharing with us carefully reconstructed pictures that have benefited from the wonderful technology our Society has been instrumental in creating.

Call for Nominations: 2006 IEEE Reynold B. Johnson Data Storage Device Technology Award

The IEEE Reynold B. Johnson Data Storage Device Technology Award is presented for outstanding contributions to the advancement of information storage with emphasis on technical contributions in computer data storage device technology.

The award may be presented to an individual, team, or multiple recipients up to three in number. The recipient of the award receives a bronze medal, certificate, and cash honorarium. The nomination deadline is 1 July 2005.

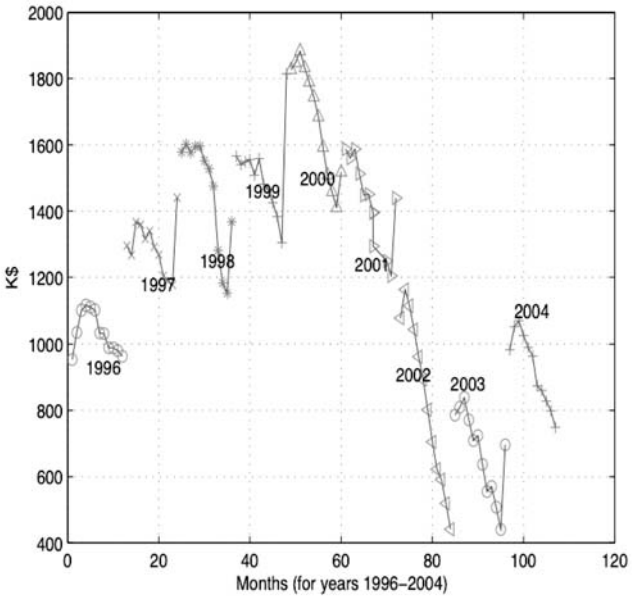
For nomination forms, visit the IEEE Awards Web Site, www.ieee.org/portal/pages/about/awards/sums/johnsondsdt.html, or contact IEEE Awards Activities, 445 Hoes Lane, Piscataway, NJ, USA, 08855-1331; tel: +1 732 562 3844; email: awards@ieee.org.

Treasurer's Corner

Muriel Médard

This brief Treasurer's Corner is the first in a new series of regular updates on the financial health of our Society. The Board of Governors' hope is that it will help members follow and participate in different aspects of the governance of our Society.

A brief synopsis is given below in a graph presented at the last Board of Governors meeting (I am here building on the work of my predecessor, Marc Fossorier). This graph only includes the final numbers from IEEE, and not more recent numbers, which may be subject to some revisions.



The finances are generally on the mend compared to a couple of years ago, but we are still not fully recovered. The loss of money we experienced was predominantly due to the fact that IEEE, during difficult times, withdrew considerable sums from the societies due to the fact that investment returns were quite paltry during those times. As you may notice, we tend to begin the year with a nice boost. This is caused by dues coming in, but also by reimbursements from IEEE. For instance, administration fees levied by IEEE for 2003 were $65,500 instead of the projected $254,900. Infrastructure costs were partly returned ($69,000). These reimbursements show up at the beginning of the year. Unfortunately, for 2004 the administration reimbursements were $24,800 over a payment of $243,300.

Overall, we expect a surplus of $194,800 for the past year, which is well ahead of the budget. The bulk of this surplus is due to investment returns and to lower production costs for print copies of the IT Transactions. Note that even with these lower production costs, we still lose money on members who request print copies.

These are our current predictions. Note that they do not include any investment returns. They also do not include the fact that our ISIT 2004 was wildly successful financially, with a surplus of about $90,000.

Major income sources (2005 predictions):

- IT Transactions: $690,300
- Fees: $114,300
- Conferences: $348,500

Total (with grants, etc…) $1,189,200

Major expenses (2005 predictions):

- IT Transactions: $524,700
- Newsletter: $29,300
- Conferences: $265,600
- Administration: $277,900
- Committee: $51,200

Total (with grants, etc…) $1,192,000

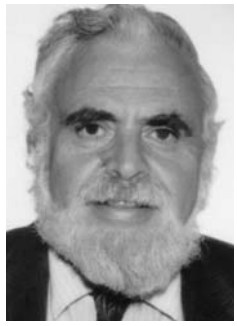
These numbers, which are meant to be conservative, show the importance of successful conferences to our Society, since publication costs/revenues are difficult to control and investment returns are truly outside our influence.

I hope this brief overview of our finances is useful to our members. Please feel free to e-mail me at medard@mit.edu with any comments or questions. I shall try to gather the most frequently asked questions from our members and address them in future Treasurer's Corners.

GOLOMB'S PUZZLE COLUMN™

Some Matrix Questions

Solomon W. Golomb



1. Is it possible to find 2×2 real matrices A and B such that A is similar to B but AB is not similar to BA?

2. The **hermitian** of a complex $n \times n$ matrix M, denoted M^H, is $(M^T)^* = (M^*)^T$, where M^T is the **transpose** of M and M^* is the **complex conjugate** of M. If U and N are complex $n \times n$ matrices with $U^H = U^{-1}$ and $NN^H = N^H N$, then U is called **unitary** and N is called **normal**. Prove or disprove: "If, for a given complex $n \times n$ matrix M, there exists a unitary matrix U such that $U^{-1}MU = \Lambda$, where Λ is a diagonal matrix, then M is normal."

3. Prove or disprove: "If N_1 and N_2 are normal $n \times n$ matrices, then their product N_1N_2 is normal."

4. Using 2×2 matrices over $GF(2)$ as elements, form a four-element ring R which has two "left identities" but no "right identities". (A **left identity** e_L has the property that $e_L \cdot a = a$ for all a in R. A **right identity** e_R has $a \cdot e_R = a$ for all a in R.)

5. If the n^2 elements of an $n \times n$ matrix A are integers chosen independently and at random, what is the probability that $|A|$, the determinant of A, is odd?

The Information Theory e-print arXiv

In the March Newsletter, Steve McLaughlin and Dave Forney gave detailed information on the IT Society's open access initiative using the preprint server arXiv.org. In this article we provide more background information on the arXiv in general, and in particular on the information theory categories cs.IT and math.IT, of which we have the honor to be the moderators.

The e-print arXiv of physics, mathematics, and computer science started at Los Alamos in 1991 with a preprint server in the area of high-energy and theoretical physics. Over the years it has become the primary electronic preprint server in the world. Nowadays it is maintained at Cornell University and mirrored in 15 countries. The arXiv averages more than 100 preprint submissions every day. Each submitted preprint receives a 'time-stamp' which stays with the preprint forever. Papers submitted in 1991 can still be retrieved from the arXiv as they were originally submitted.

In certain areas of mathematics and physics, more than 90% of the published papers appear first on arXiv. The most active areas for arXiv tend to be the areas where a preprint category has existed longest. In physics, the areas of 'Astrophysics' and 'Condensed Matter' have existed since 1992, and average about 25 submissions a day. In mathematics, the most active area is 'Algebraic Geometry,' which averages about 2 submissions a day. All of mathematics sees about 20 submissions a day. The computer science area is newer and not yet as active, with about 3 submissions a day.

About a year ago, 'Information Theory' was given its own subcategory. This subcategory was placed within the computer science category as cs.IT, and is also scheduled to be aliased within mathematics as math.IT. In mid-2004, papers in coding and information theory that had already been posted on the arXiv were cross-listed in cs.IT. Since then, the number of papers posted has been growing steadily--- 19 in Q3 2004, 26 in Q4, and 72 in Q1 2005--- and now averages about one submission a day.

Readers interested in browsing through these papers may start at http://arxiv.org/list/cs.IT/05. Changing 05 to 0504 will yield all papers submitted to cs.IT in April 2005, and so forth. One may also sign up for automatic e-mail announcement of daily postings in cs.IT by sending an e-mail message to cs@arXiv.org with "subscribe [your name]" as the subject line and "add IT" as the text.

Both computer science and mathematics have convenient front ends to browse their particular areas. The front end of CS is the Computing Research Repository (CoRR), sponsored by the ACM and best accessed via http://arxiv.org/corr/home. The front end for mathematics is maintained at UC Davis and accessed via http://front.math.ucdavis.edu.

The preferred way of submitting papers is via LaTeX, which has proved to be the most stable source for guaranteeing migration to

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GOLOMB'S PUZZLE COLUMN™

Perfect Powers and Powerful Numbers

Solomon W. Golomb

The set P (the *perfect powers*) consists of all squares, cubes, and higher powers of the positive integers. The set Q (the *powerful numbers*) consists of those positive integers n for which, if a prime p divides n then p^2 divides n.

1. The relation between the sets P and Q is given by:
   c. Q = {set of all finite products of elements of P}.
   Proof. It is clear that every (finite) product of perfect powers is a powerful number. It is also clear that every powerful number is a finite product of powers (higher than the first power) of prime numbers, and therefore a finite product of elements of P. □
   The other alternatives offered do not work. For "a. $Q = P \times P$", the element $q = 2^2 \cdot 3^3 \cdot 5^5$ is in Q but not in $P \times P$. For "b. $Q = P + P$", $4 + 9 \in P + P$, but $13 \notin Q$.

2. The $\sum_{n \in Q} \frac{1}{n}$ is given by:

   c. $\zeta(2)\zeta(3)/\zeta(6)$.
   Proof. Every powerful number n can be written uniquely in the form $n = sc$, where s is a perfect square and c is a perfect cube, subject to the added condition that if p is a prime divisor of c, then p^3 is the exact power of p that divides c. The idea here is that with $n = \prod_{i=1}^{r} p_i^{a_i}$, where $p_1, p_2, \cdots, p_r$ are the distinct prime divisors of $n \in Q$, all the a_i's satisfy $a_i \geq 2$. When a_i is even, we use $p_i^{a_i}$ as a factor of s. When a_j is odd (and therefore ≥ 3), we use p_j^3 as a factor of c, and $p_j^{a_j - 3}$ as a factor of s. (Since a_j is odd, $a_j - 3$ is even, so $p_j^{a_j-3}$ is a perfect square.) For example, if $n = 2^2 \cdot 3^3 \cdot 5^5$, we have $s = 2^2 \cdot 5^2 = 10^2$ and $c = 3^3 \cdot 5^3 = 15^3$, with $n = sc$.
   In view of this unique factorization of powerful numbers,

$$\sum_{n \in Q} \frac{1}{n} = \left(\sum_{a=1}^{\infty} \frac{1}{a^2} \right) \cdot \prod_{\text{all primes } p} \left(1 + \frac{1}{p^3} \right) = \zeta(2) \cdot (\zeta(3)/\zeta(6)) .$$

   The relationship $\prod_{\text{all } p} \left(1 + \frac{1}{p^3}\right) = \zeta(3)/\zeta(6)$ follows from $\left(1 + \frac{1}{p^3}\right) = \left(1 - \frac{1}{p^6}\right) / \left(1 - \frac{1}{p^3}\right)$ and the Euler Product Formula whereby $\prod_{\text{all } p} \left(1 - \frac{1}{p^s}\right) = \frac{1}{\zeta(s)}$ for $s > 1$. □
   The other alternatives offered do not work. For "a. $\zeta(2) + \zeta(3) - \zeta(6)$", while the reciprocals of the squares and cubes are included, many other powerful numbers (e.g. $2^5, 3^5, 5^5, 2^7, \ldots$) do not have their reciprocals included. For "b. $\zeta(2)\zeta(3) - \zeta(6) + 1$", all the right reciprocals occur, but many occur more than once. For example, $\frac{1}{2^{36}}$ occurs as a product of a square reciprocal times a cube reciprocal in $\zeta(2)\zeta(3)$ in seven ways $(2^{36} = (2^{18})^2(1)^3 = (2^{15})^2(2^2)^3 = (2^{12})^2(2^4)^3 = (2^9)^2(2^6)^3 = (2^6)^2(2^8)^3 = (2^3)^2(2^{10})^3 = (1)^2(2^{12})^3)$, but is removed only once in $\zeta(6)$.

3. For $\sum_{n \in P} \frac{1}{n}$, the correct answer is "b. $-\sum_{k=2}^{\infty} \mu(k)\zeta(k)$."
   Proof. This is a typical "inclusion-exclusion" proof. The first term, $-\mu(2)\zeta(2) = \zeta(2) = \sum_{m=1}^{\infty} \frac{1}{m^2}$, gives the reciprocals of all the perfect squares. The next term, $-\mu(3)\zeta(3) = \zeta(3) = \sum_{m=1}^{\infty} \frac{1}{m^3}$, gives the reciprocals of all the perfect cubes; but then $-\mu(6)\zeta(6) = -\mu(6) = -\sum_{m=1}^{\infty} \frac{1}{m^6}$ removes the reciprocals of the sixth powers, which appeared in both $\zeta(2)$ and $\zeta(3)$. Similarly, $-\mu(5)\zeta(5) = \zeta(5) = \sum_{m=1}^{\infty} \frac{1}{m^5}$ puts in the reciprocals of all fifth powers, but then $-\mu(10)\zeta(10) = -\sum_{m=1}^{\infty} \frac{1}{m^{10}}$ and $-\mu(15)\zeta(15) = -\sum_{m=1}^{\infty} \frac{1}{m^{15}}$ remove terms that were counted twice, and $-\mu(30)\zeta(30) = \sum_{m=1}^{\infty} \frac{1}{m^{30}}$ puts back terms once that appeared three times (in $\zeta(2)$, $\zeta(3)$, and $\zeta(15)$) but were also removed three times (in $-\zeta(6)$, $-\zeta(10)$, and $-\zeta(15)$), and so on. □

Alternatives "a." and "c." had nothing to recommend them, but were included to provide alternatives for the random guesser.

4. For $\sum_{\substack{n\in P\\ n>1}} \frac{1}{n-1}$, the surprising correct answer is "a. 1".
Proof. We start with $\sum_{\substack{n\in P\\ n>1}} \frac{1}{n} = \sum_{k\notin P} \left(\frac{1}{k^2}+\frac{1}{k^3}+\frac{1}{k^4}+\cdots\right) = \sum_{k\notin P} \frac{\frac{1}{k^2}}{1-\frac{1}{k}} = \sum_{k\notin P} \frac{1}{k(k-1)}$. (The first equality is the crucial step.

It asserts that each powerful number occurs *uniquely* as a second or higher power of a number which is *not* already a perfect power.) Next, we use $\sum_{k=2}^{\infty} \frac{1}{k(k-1)} = \sum_{k=2}^{\infty} \left(\frac{1}{k-1}-\frac{1}{k}\right) = 1$, a famous "telescoping sum". Thus, $\sum_{\substack{n\in P\\ n>1}} \frac{1}{n} = \sum_{k\notin P} \frac{1}{k(k-1)} = 1 - \sum_{\substack{k\in P\\ k>1}} \frac{1}{k(k-1)}$, from which $1 = \sum_{\substack{k\in P\\ k>1}} \frac{1}{k} + \sum_{\substack{k\in P\\ k>1}} \frac{1}{k(k-1)} = \sum_{\substack{k\in P\\ k>1}} \left(\frac{k-1}{k(k-1)}+\frac{1}{k(k-1)}\right) = \sum_{\substack{k\in P\\ k>1}} \frac{1}{k-1}$, as asserted. □

The alternative answers, "b. $\log_e 2$" and "c. $\frac{\pi}{4}$", were offered as diversions.

5. "There are infinitely many pairs $(n, n+1)$ of consecutive powerful numbers". The pair (8, 9) was given as an example.
Proof. It suffices to show that the "Pell equation", $x^2 - 2y^2 = 1$, has infinitely many solutions with y even. Then $(2y^2, x^2)$ is a pair of consecutive powerful numbers for each such solution.
We start with the solution (9, 8) to $3^2 - 2\cdot 2^2 = 1$, and factor it as $(3+2\sqrt{2})(3-2\sqrt{2}) = 1$. Raising both sides to the power n, $(3+2\sqrt{2})^n(3-2\sqrt{2})^n = 1^n = 1$, we get a different solution for each n. For example, at $n = 2$, $(3+2\sqrt{2})^2 = 17+12\sqrt{2}$, from which $17^2 - 2\cdot 12^2 = 1$, and (288, 289) is a pair of consecutive powerful numbers. At $n = 3$, the Pell solution is $99^2 - 2\cdot 70^2 = 1$, and (9800, 9801) is the consecutive pair. At $n = 4$, the Pell solution is $577^2 - 2\cdot 408^2 = 1$, and the consecutive pair of powerful numbers is (332928, 332929); etc. (Pairs not of this type also exist.) □
Note. For more results about powerful numbers, see "Powerful Numbers" by S.W. Golomb, *American Mathematical Monthly*, vol. 77, no. 8, October, 1970, pp. 848 - 852.

The Information Theory e-print arXiv continued from page 6

other formats. Indeed, all papers on arXiv may be downloaded in different format types such as DVI, PostScript and PDF, and as new formats appear in the future it should be possible to generate them from the existing LaTeX source.

Submissions to the information theory category cs.IT are monitored by us as moderators. If a paper is obviously not a scientific paper related to information theory, then the authors will be informed by the moderators that the paper does not belong in this category, and the paper will be removed. However, in the one-year existence of cs.IT no such action has been needed.

If authors revise or update their paper, they may submit a revised version. The revised version gets a new time-stamp, while the older version remains available on the arXiv.

Once a paper is posted on arXiv it may be referenced as follows:

[1] M. Fossorier, "Critical point for maximum likelihood decoding of linear block codes," *IEEE Comm. Letters*, to appear. arXiv: cs.IT/0504032.

The paper may then be accessed at http://arxiv.org/abs/cs.IT/0504032.

Once a paper is published in a journal, we recommend that the author add the bibliographic reference information to arXiv, including the Digital Object Identifier (DOI) number. This gives readers the correct citation, and allows them to download the published version simply by clicking on the DOI number.

As moderators, we are interested in improving the accessibility and ease of use of arXiv as much as possible. We are aware of issues such as lack of browsability on cs:arXiv, as compared with math:arXiv; authors' resistance to submitting source LaTeX documents; and minor annoyances with the registration and submission process. We hope to constantly address such issues through new releases of front ends and arXiv itself. Authors are encouraged to let us know of any improvements that they would like to see.

It is our hope that cs.IT and math.IT will help the information theory community to disseminate its research in a timely and organized manner, and that this will ultimately help the progress of the field of information theory.

Joachim Rosenthal and Madhu Sudan
Moderators of math.IT and cs.IT

IEEE Information Theory Society Board of Governors Meeting

Prospect House, Princeton University, Princeton, NJ USA, March 17, 2004

Mehul Motani

Attendees: Anthony Ephremides, Hideki Imai, Ralf Koetter, Muriel Médard, Urbashi Mitra, Mehul Motani, David L. Neuhoff, Vincent Poor, Radha Poovendran, Bixio Rimoldi, Paul Siegel, Alexander Vardy, Sergio Verdu, Jack Wolf

The meeting was called to order at 13:20 by Society President Hideki Imai. The members of the Board were welcomed and introduced themselves.

1. The President welcomed the board members present, including six new members.

2. The agenda was approved and distributed.

3. The action items from the previous meeting in Allerton on October 1, 2003 were reviewed. The minutes of the previous meeting were approved with minor amendments.

4. The President presented his report by presenting relevant items from the IEEE TAG Meeting.

   The President reviewed the IEEE President's Message.

   The President reported that the finances of the Society are in good order but the IEEE is still keeping the Society in the 2004 Watchlist.

   The President reported on the declining in 2003 membership, 13.5% for the IT Society and 5.6% for IEEE overall.

   The President then discussed the issue of open access to IEEE publications. Currently, IEEE does not support open access, but there are numerous benefits to open access. In addition, the Sabo bill (in Congress) would mandate open access to publications that result from US government supported research.

   →**Action Item** The matter of open access to publications will be further discussed at the next meeting in Chicago.

   The president reported that the Society is aiming to get more deeply involved in new related technologies and is considering the possibility of cooperation outside IEEE for new technology areas. One candidate area is Cryptology, which is in the scope of the Society's interests.

   The President reported on a possible collaboration with the International Association of Cryptologic Researchers (IACR) in the form of a joint workshop with IACR.

   →**Action Item** The President will discuss further at the next meeting in Chicago.

   The President discussed an invitation from the Sensors Council for IT Society representation. Anthony Ephremides agreed to represent the Society in the Sensors Council.

   The President encouraged all members to participate in the Call for Nominations for the IT Society Distinguished Service Award, meant to honor outstanding leadership and exceptional service to the Society.

   The president reported on the availability of proposing new initiatives to the IEEE. New initiatives can have funding levels of 50K and greater, be single or multi-year efforts, and require a formal proposal.

5. Muriel Médard presented the Treasurer's report. The Society's net worth was reviewed. It was noted that the final number for year 2003 were not yet available.

   It was noted with sadness that the Treasurer for the 2003 Paris IT Workshop has passed away. There is uncertainty in what will happen and in what timeframe. The possibilty of IEEE fines was mentioned.

   The final number for the 2003 ISIT workshop are not yet available.

   Muriel Médard reported briefly on membership.

6. The IT Transactions Editor-in-Chief gave an update on the Society Transactions, noting that submissions continue to grow.

   The Board unanimously approved the following Associate Editor appointments: Peter L. Barltett.

   The Board unanimously approved inviting Katherine Perry and Nela Rybowicz to the next ISIT in Chicago.

   Ralf Koetter and Muriel Médard discussed a special issue with the ACM/IEEE Transactions on Networking on Network Coding.

   Paul Seigel gave a demonstration of Pareja, a web-based paper submission and tracking system developed by Publications Editor Kevin Quirk and his colleagues. There was a subsequent discussion of another paper submission system called EDAS.

   →**Action Item** The Board requested Paul Seigel to compare EDAS and Pareja and report at the next meeting.

7. The activities of the IT Society Publications Committee, headed by John Anderson, were then discussed.

   Ralf Koetter talked about the editorial process that publications udergo as part of publication in the Society Transactions. It was noted that some papers are in the system for 3-4 years.

It was suggested that the Society should clearly state it's editiorial policies explicitly

Another suggestion was to institute a penalty system.

Another suggestion was to have an annual meeting at which papers are discussed, thus putting in place some sort of deadline.

→**Action Item** The matter is to be further discussed at the next meeting in Chicago.

8. Ms. Cecilia Jankowski, representing the IEEE, gave an update on the IEEE and OFAC. In summary, the US Treasury Office of Foreign Assets Control (OFAC) had placed restrictions in the publishing process with respect to manuscripts from authors from embargoed countries. The update focused on what IEEE was doing about this.

   After the presentation, the Board discussed the matter. It was noted that it was too late to do anything. It was suggested that maybe what is needed is a symbolic gesture.

   Vincent Poor suggested writing a personal letter to the Iranian members of the IEEE.

   The President requested Dave Forney to draft a statement. The IT Society resolution is reproduced below:

   The Board of Governors of the IEEE Information Theory Society, recognizing the difficult position into which the IEEE has been put by its interpretation of U.S. Treasury Office of Foreign Asset Control (OFAC) regulations embargoing services to residents of Iran and other countries, as well as by subsequent rulings requested from OFAC, nonetheless:

   1. Expresses its extreme dismay at the operation of the IEEE embargo and its effects on the IEEE's reputation as an international scientific society;

   2. Condemns the application of embargo regulations to scientific exchange and publishing as contrary to the fundamental values of our society;

   3. Encourages the IEEE to stand up for universal principles of open scientific interchange and cooperation;

   4. Expresses its profound hope that the current negotiations between IEEE and OFAC will soon result in the full restoration of the status quo ante; and

   5. Urges that all possible measures be taken in the interim to minimize damage to members, to the IEEE, and to its societies.

   Shortly after the meeting, the US lifted its restrictions on IEEE publishing. Specifically, OFAC ruled on 2 April that the IEEE's publishing process is exempt from OFAC regulations and licensing requirements for scholarly papers submitted by authors from Cuba, Iran, Libya, and Sudan.

   It was agreed that the IT Society resolution should still be included in its present form in the minutes of our March meeting as reflecting the sense of the meeting at that time. However, further efforts to publicize this resolution, e.g., by putting it on our Web site, were deemed no longer to be necessary.

9. David Neuhoff gave an update of membership development and discussed the 13% decline in membership. It was questioned how much of the decrease was due to the IEEE mistake in stating Society membership fees last year.

   Ways of attracting members were then discussed. Suggestions to attract fresh PhDs include (a) Best thesis prize, (b) Mixers at conferences, (c) Best Student paper award, (d) Panel at ISIT, and (e) Publishing thesis abstracts in the IT Society Newsletter.

   It was also suggested to use the Society Transactions as a centerpiece. The Transactions could include more tutorial articles. The Transactions/Newsletter could also contain a news section.

   Anthony Ephremides suggested to add tutorials to sister society conferences. For key topics, it was suggested to get outside researchers involved.

   It was suggested to take a survey to poll former members why they did not renew. This could be in the form of a letter or electronic survey.

   David Forney suggested the need for a tutorials editor.

10. Jack Wolf related his experience at an international conference of the Operations Research Society. The OR Society gives an award each year for the Best PhD Dissertation.

    The thesis is nominated by a thesis advisor and a committee selects and invites a subset of the authors to the annual conference. At a special session, the candidates gives an oral presentation and the committee selects a winner.

    The Board discussed adopting a similar method to award a best thesis for our Society.

    The President appointed a task force to look into setting up a Outstanding PhD Dissertation award. The members include Jack Wolf, David Neuhoff, Steven McLaughlin, and the Program Chairs of the relevant ISIT.

11. The Awards Committee report was then presented. The committee has received 13 nominations for the IT Society best paper award and 8 nominations for the Joint Comsoc/IT Society best paper award.

    Regarding IEEE wide awards, the Awards committee is in the process of producing nominations. It was reported that nominations for the Hamming Medal are good.

12. The Nominations Subcommittee report was then presented.

It was noted that the Nominations Subcommittee assembled three subcommittees in 2004, namely the Shannon Award Selection Subcommittee, the Distinguished Service Award Selection Subcommittee, and the Awards Subcommittee.

13. Bixio Rimoldi discussed matters related to Symposia and Workshops.

    (a) ISIT 2004 in Chicago: 928 papers submitted, 700 people. Friday reception cancelled to accommodate more sessions.

    (b) ISIT 2005 in Adelaide: Everything okay.

    (c) ISIT 2006 in Seattle: All meetings on same floor, hotel rates further reduced.

    (d) ISIT 2007 expected to be in Salzburg, Martin Bossert as liaison.

    (e) ISIT 2008 to be in Toronto, Canada, Frank Kschishang as liaison.

    (f) ITW 2004 in San Antonio: Sessions identified, registration fee less than $350.

    (g) ITW 2005 in New Zealand, Aug/Sept timeframe.

    (h) There are no IT Workshops in 2006. The need for more workshops was noted. Bixio Rimoldi will send an email to solicit new ITWs.

14. The Board approved technical co-sponsorhsip of the WiOpt Workshop.

15. It was noted that Urbashi Mitra (Society Information Officer) has compiled a document outlining all officers' responsibilities.

16. It was announced that the second BOG meeting will be held in conjunction with ISIT on 27 June 2004 in Chicago, USA. The third BOG meeting will be held at ISITA on 11 October in Parma, Italy.

17. The meeting was adjourned at 17:00.

IEEE Information Theory Society Board of Governors Meeting

Chicago Downtown Mariott, Chicago, IL, USA, June 27, 2004

Mehul Motani

Attendees: John Anderson, Thomas Cover, Anthony Ephremides, Dave Forney, Marc Fossorier, Tom Fuja, Andrea Goldsmith, Alex Grant, Johannes Huber, Hideki Imai, Ralf Koetter, Ryuji Kohno, Joseph A. O'Sullivan, Steven W. McLaughlin, Muriel Médard, Urbashi Mitra, Mehul Motani, David L. Neuhoff, Lance C. Pérez, Katherine Perry, Vincent Poor, Lars Rasmussen, Nela Rybowicz, Bixio Rimoldi, Shlomo Shamai, Paul Siegel, David Tse, Alexander Vardy, Han Vinck.

The meeting was called to order at 13:30 by Society President Hideki Imai. The members of the Board were welcomed and introduced themselves.

1. The agenda was distributed. An item related to the funding situation at NSF was added to the agenda. The Board unanimously approved the updated agenda.

2. The action items from the previous meeting in Princeton on March 17, 2004 were reviewed. The minutes of the previous meeting were approved with minor amendments.

3. The President presented his report.

   Aaron Gulliver has stepped down as the webmaster of the Society web pages. Mehul Motani has kindly agreed to serve as the new webmaster.

   Technical co-sponsorship was requested by the 4th International Symposium on Turbo Codes to be help in Munich in 2006. The Board unanimously approved Society technical co-sponsorship.

   The Distinguished Service Award for 2004 has been awarded to James L. Massey.

   The President reported on the IEEE TAB meeting in June 2004. He noted that the new periodical proposal for the IEEE Transactions on Information Forensics and Security was deleted prior to being presented. He further discussed the issue of open access to IEEE publications. He noted that the open access issue is still a hot topic and that the IEEE will present its response later in 2004.

4. It was proposed to change the name of the Distinguished Service Award to the Aaron D. Wyner Award in honor of the outstanding leadership and service rendered by Aaron Wyner to the Society. It was noted that this required an amendment to the Society Bylaws.

   The Board unanimously approved the proposed name change and the required change to the Society Bylaws.

5. Muriel Médard presented the Treasurer's report. The Society's net worth was reviewed. The numbers for Year 2003 as of May 2004 are as follows: Loans Receivable - 121K, Net Worth - 696K.

   An update of the finances for conferences and workshops from 2003 - 2006 was given.

   The Treasurer gave a brief presentation on a snapshot of

Society finances. She noted that the Society finances are overall on the mend, but the Society is still on the IEEE financial watchlist.

She noted that in 2003, the Society made almost as much money on conferences as on publications. Despite this, the Society still has lower conference surpluses than other societies.

Regarding membership, it was noted that it was beneficial (in terms of finances) to have members sign up for electronic access only membership.

6. The President appointed the members of an ad-hoc committee on financial matters. The members of the IT Society Finance Committee are Muriel Médard (Chair), Marc Fossorier, Hideki Imai, and Steven McLaughlin.

7. The Board unanimously approved the appointment of Vincent Poor as the next IT Transactions Editor-in-Chief.

8. The IT Transactions Editor-in-Chief gave an update on the Society Transactions.

   He noted that submissions continue to grow. Specifically, submissions were up 12% in 2003 and 24% in 2004. He also noted that web-based submission process was activated as of June 2004.

   The IT Transactions has an impact factor of 2.045 according to the 2002 Journal Citation Report rankings.

   An IT related computer science category names cs.IT was established at arXiv.org.

   The issue of guest editors publishing in the special issue they are guest editing was raised and discussed. The suggestion to let the Editor-in-Chief handle these submissions was made.

   Ralf Koetter and Muriel Médard discussed the special issue on Network Information Theory and Coding with the ACM/IEEE Transactions on Networking. The main issue now is how to give access to TON subscribers.

   The issue of frequency of special issues was discussed. It was noted that special issues can be used to attract non-subscribers. There was also a suggestion to publish a double volume with both regular and special issue articles.

   The Board unanimously approved the following Associate Editor appointments: Vinay Vaishampayan (At Large), Anders Host-Madsen (Detection and Estimation), and Kingo Kobayashi (Shannon Theory).

   The Board thanked Katherine Perry and Nela Rybowicz for their exceptional service to the IT Transactions and the Society.

   It was noted that the response of the editorial board and the other users of the Pareja, a web-based paper submission and tracking system, was positive.

   The Board expressed its gratitude to Paul Siegel for outstanding service to the Society and the IT Transactions as Editor-in-Chief.

9. The activities of the IT Society Publications Committee, headed by John Anderson, were then discussed.

   It was noted that there was to be an open meeting on publications at ISIT 2004 to discuss how the Society can best improve its publications and the publication process.

   Several issues such as electronic publishing and reviewer/associate editor delays were discussed. The discussion ended with all agreeing that the Transactions needed to make clear its policies in these and other issues.

   →**Action Item** The results of the open meeting on publications will be discussed at the next Board meeting.

10. Alexander Vardy discussed the establishment of an IT-related category, called cs.IT, at arXiv.org, an e-print pre-print server.

    There was some concern that posting IT articles at arXiv.org will cut revenue for the Society Transactions and IEEE.

    After much discussion, the following motion was put forth: The Board hears and welcomes the formation of a cs.IT category at www.arXiv.org and forms a subcommittee to discuss further and report at the next meeting.

    The Board unanimously approved the motion and formed the following subcommittee: Dave Forney (Chair), Ralf Koetter, Alex Vardy, Han Vinck, and Vince Poor.

    →**Action Item** The arXiv Study Committee will present a report at the next Board meeting.

11. The issue of open access to IEEE publications was then briefly discussed. It was noted that IEEE is working to formulate its position on this issue and the Board will discuss the matter after that.

12. The Awards Subcommittee report was presented by Steven McLaughlin.

    The recipients of the 2004 IT/ComSoc Joint Paper Award are: G. Caire and S. Shamai, "On the achievable throughput of a multi-antenna Gaussian broadcast channel" IEEE Trans. Inform. Theory, Vol. 49, No. 7, pp. 1691–1706, July 2004.

13. The 2004 Best Paper Award nominations have been reviewed and shortlisted to three papers. The Awards subcommittee submitted these names to the Board for discussion and selection.

    Although the ByLaws indicate that the Board is to vote and select the best paper, there was concern that it was difficult for the Board to discuss and select the best paper at the Board meeting itself. Since the Awards subcommittee actually has gone through a proper discussion of the papers, it was suggested that it make an award recommendation to the Board.

The following motion was put forth: to suspend the ByLaws regarding voting for the Best Paper Award at the meeting and request that the Awards subcommittee provide more information about the papers and make an award recommendation.

The Board unanimously approved the motion.

→**Action Item** The Awards subcommittee to present its recommendation to the board regarding the Best Paper Award. The Board will vote at the next meeting.

14. The Best PhD Dissertation Prize was discussed. The merit of the award was discussed. It was noted that this had been tried before and had failed.

    It was suggested to make more clear the eligibility of candidates.

    The following motion was put forth: The Board applauds the idea and requests the committee to come back with a detailed proposal.

    The Board unanimously approved the proposal.

    →**Action Item** The ad-hoc committee on Best PhD Dissertation Prize to make a proposal at the next meeting.

15. There was a discussion on the selection process for the Best Paper Award. The current process is that the Awards subcommittee shortlists the numerous nominations and presents three candidates to the Board, which selects the winner.

    The disadvantage of this process is that it selects the top paper based on committee votes based on the information in the nomination forms alone.

    It was suggested that a better way is for the committee to discuss the papers thoroughly and come to a consensus on what makes the top three papers so exceptional. This rationale along with the nominations and votes would make it useful for the Board to make its decision.

    It was noted that a change in the selection process for the Best Paper Award required a change in the Society ByLaws.

16. David L. Neuhoff discussed membership development.

    It was noted that the Society membership has declined 25% over the last two years. This makes membership development a critical issue for the Society.

    There was a discussion on a proposal to increase membership. Three main areas were highlighted: (i) encouraging graduating students to join the IT Society, (ii) encourage mid-career membership, and (iii) make the IT Transactions more accessible and attractive.

17. Lance C. Pérez reported on the IT Newsletter. He discussed alternative production options for the newsletter. His recommendation is to remain with IEEE.

18. Mehul Motani reported on the Society website. Currently, the website is hosted on a personal desktop machine. He proposed to host the website with a professional ISP.

    Although this would incur some cost, it would lead to a more stable website and smooth transitions when new administrators take over.

    The Board unanimously approved $700 per year for website hosting.

19. The Education Subcommittee has nothing to report.

20. Bixio Rimoldi discussed matters related to Symposia and Workshops.

    (a) ISIT 2004 in Chicago: Everything okay.

    (b) ITW 2004 in San Antonio: 126 submissions, 50% acceptance ratio, Eight sessions of invited papers, Plenary speakers identified, Registration fee less than $375.

    (c) ISIT 2005 in Adelaide: Call for Papers out, deadline of Jan 31, 2005 with decisions by May 2005. Other details being worked out and information will be available on the website.

    (d) ITW 2005 in New Zealand: Call for Papers is out, Focus is on Coding and Complexity, will be held week before ISIT 2005, Other details being worked out, All other issues on track.

    (e) ISIT 2006 in Seattle: Hotel contract done, website skeleton up, TPC being formed.

    (f) ISIT 2007: Originally expected to be in Salzburg, Austria, Facing several problems, Need local co-chair, Other options being explored.

    (g) ITW 2003: Cancelled and not to be rescheduled.

    (h) Proposal for ITW in 2005: Workshop on Theory & Practice of Information Theoretic Security, November 2005 timeframe, 3 day workshop in Japan, Technically co-sponsored by IACR.

    The Board unanimously approves the ITW 2005 proposal.

21. Tom Fuja presented the report of the Nominations Subcommittee.

    He presented the following Twelve names of Society members willing to stand for election to the Board: Giuseppe Caire, Daniel J. Costello, Jr., Marc Fossorier, Aleksander Kavcic, Urbashi Mitra, Krishna Narayanan, B. Sundar Rajan, Ludo M.G.M. Tolhuizen, Mahesh Varanasi, Venugopal V. Veeravalli, Xiaodang Wang, and Kenneth Zeger.

    In addition three additional nominations for election to the Board were made: Muriel Médard, Jong-Seon No, and Wojtek Spacnowski.

    Two nominations for the Second Vice President were made:

Marc Fossorier and Bixio Rimoldi.

The Board unanimously approved all the nominations.

22. The following new business items were discussed.

(a) Venu Veeravalli discussed the funding situation at NSF and specifically of the CISE Directorate.

The reorganization at NSF/CISE does not look good for IT. Communications and Information Theory are now grouped with Computer Communiation Foundations and Computer Networking Systems. In addition, the funding levels have been cut significantly.

It was noted that the IT community needs to do its own marketing and lobbying to CISE/NSF in order to protect its place in research funding.

(b) Ralf Koetter and Muriel Médard presented the preliminary Call for Papers for the IT Transactions special issue on Network Information Theory and Coding with the ACM/IEEE Transactions on Networking.

The Board unanimously approved the following motion: The Board welcomes the special issue and encourages the distribution of the CFP.

23. It was announced that the next BOG meeting will be held in conjunction with ISITA on 11 October 2004 in Parma, Italy.

24. The meeting was adjourned at 18:30.

New Books

Raymond Yeung

Fundamentals of Wireless Communication,
by David Tse and Pramod Viswanath. Cambridge University Press, 2005, 585 pp., $65, ISBN 0521845270.

Description:
The past decade has seen many advances in physical-layer wireless communication theory and their implementation in wireless systems. This book takes a unified view of the fundamentals of wireless communication and explains the web of concepts underpinning these advances, at a level accessible to an audience with a basic background in probability and digital communication. Topics covered include MIMO communication, space-time coding, opportunistic communication, OFDM and CDMA. The concepts are illustrated using examples from wireless systems such as GSM, IS-95 (CDMA), IS-856 (1 x EV-DO), Flash OFDM and Arraycomm SDMA systems. Particular emphasis is placed on the interplay between concepts and their system implementation. An abundant supply of exercises and figures reinforce the material in the text. This book is intended for use on graduate courses in electrical and computer engineering and will also be of interest to practicing engineers.

Wireless Internet Telecommunications,
by K. Daniel Wong. Artech House, 2005, 232 pp., £67, ISBN 1-58053-711-1.

Contents:
Overview - Introduction; Components of the Internet; Wireless Networks; Relevant Internet Technologies - Multimedia Transport; Session Control; Mobility; Quality of Service; Security; IPv6; Services, Applications and Other Miscellaneous Topics; IMS in UMTS - Evolution from GSM to UMTS; The IP Multimedia Sub-System (IMS); Looking Ahead - Future Possibilities.

Advances in Mobile Radio Access Networks,
by Y. Jay Guo. Artech House, 2004, 258 pp., £59, ISBN 1-58053-727-8.

Contents:
Introduction; Emerging Radio Technologies; Mobile Terminal Positioning; High Speed Downlink Packet Access (HSDPA); Multiple Antennas; Orthogonal Frequency Division Multiple Access Systems; RAN Architecture Evolution; Autonomic Networks; Ubiquitous Networks.

Mobile Internet: Enabling Technologies and Services,
by Apostolis K. Salkintzis. CRC Press, 2004, 408 pp., $129.95/£78.99, ISBN 0-8493-1631-6.

Contents:
Introduction; Internet Access over Wireless LANs; Internet Access over GPRS; Internet Access over Satellites; Mobility Management in Mobile IP Networks; Quality of Service in Mobile IP Networks; Multicast in Mobile IP Networks; Secure Mobility in Wireless IP Networks; Security Issues in Wireless IP Networks; Header Compression Schemes for Wireless Internet Access; Video Streaming in Wireless Internet; Integration of Wireless LANs and Cellular Data Networks for Next-generation Mobile Internet Access.

Mobile Communications Security,
edited by Hideki Imai. Artech House, 2005, approx. 300 pp., £61, ISBN 1-58053-520-8.

Contents:
Introduction; Cryptography; Security Features in Wireless; Authentication/Authorization/Accounting; Security in GSM; Security in 3G Systems and 4G Systems; PKI in Wireless (WPKI); Wireless Application Protocol (WAP).

Mobile Computing Handbook,
edited by Mohammad Ilyas and Imad Mahgoub. CRC Press, 2004, 904 pp., $99.95/£56.99, ISBN 0-8493-1971-4.

Contents:
Introduction and applications of mobile computing; Location management; Location-based services; Caching strategies; Mobile and ad hoc wireless networks I; Mobile and ad hoc wireless networks

II; Power management; Performance and modeling; Security and privacy aspects.

The Handbook of Ad hoc Wireless Networks,
edited by Mohammad Ilyas. CRC Press, 2003, 624 pp., $139.95/£85.00, ISBN 0-8493-1332-5.

Contents:
Wireless transmission techniques; Wireless communication systems and protocols; Routing techniques in ad hoc wireless networks - part I; Routing techniques in ad hoc wireless networks - part II; Applications of ad hoc wireless networks; Power management in ad hoc wireless networks; Connection and traffic management in ad hoc wireless networks; Security and privacy aspects in ad hoc wireless networks.

Smart Antennas,
edited by Lal Chand Godara. CRC Press, 2004, 472 pp., $139.95/£85.00, ISBN 0-8493-1206-X.

Contents:
Introduction; Narrowband processing; Adaptive processing; Broadband processing; Correlated fields; Direction-of-arrival estimation methods; Single-antenna system in fading channels; Diversity combining.

Multi-Carrier Digital Communications Theory and Applications of OFDM, Second Edition,
edited by Ahmad R. S. Bahai, Burton R. Saltzberg, Mustafa Ergen. Kluwer, 2004, 412 pp., $94.00, ISBN 0-387-22575-7.

Contents:
Introduction to Digital Communications; System Architecture; Performance over Time Invariant Channels; Clipping in MultiCarrier Systems; Synchronization; Channel Estimation and Equalization; Channel Coding; ADSL; Wireless LAN Applications; Digital Broadcasting; OFDM based Multiple Access Techniques; Ultra WideBand Technologies; IEEE 802.16 and WiMAX.

Signal Processing for Mobile Communications Handbook,
edited by Mohamed Ibnkahla. CRC Press, 2004, 840 pp., $149.95/£85.00, ISBN 0-8493-1657-X.

Contents:
Mobile Communications: Technologies and Challenges; Multipath Propagation Models for Broadband Wireless Systems; Modeling and Estimation of Mobile Channels; Mobile Satellite Channels: Statistical Models and Performance Analysis; Mobile Velocity Estimation for Wireless Communications; Adaptive Coded Modulation for Transmission over Fading Channels; Signaling Constellations for Nonlinear Channels; Carrier Frequency Estimation for OFDM Systems; Filter-Bank Modulation Techniques for Transmission over Frequency-Selective Channels; Spread Spectrum Techniques for Mobile Communications; Multi-User Detection for Fading Channels; MIMO Systems: Principles and Trends; Space-Time Coding for Wireless Communications; Optimal Space-Time Coding for Transmission over Frequency-Selective MIMO Channels; Performance Analysis of MIMO Systems; Equalization Techniques for Fading Channels; Low-Complexity Diversity Combining Schemes for Mobile Communications; Overview of Equalization Techniques for MIMO Fading Channels; Neural Networks for Transmission over Nonlinear Channels; Voice over IP and Wireless: Principles and Challenges; Geolocation Techniques for Wireless CDMA Systems; Array Processing Techniques for Interference and Multipath Mitigation in GPS Receivers; Transmitter Power Control in Wireless Networking: Principles and Algorithms; Signal Processing for Multiaccess Communication Networks; Time-Frequency Analysis for Mobile Communications; Overview of Monte Carlo Signal Processing Methods for Digital Communications; Principles of Chaos Communications; Adaptation Techniques and Enabling Parameter Estimation Algorithms for Wireless Communication Systems.

SMS and MMS Interworking in Mobile Networks,
by Arnaud Henry-Labordére and Vincent Jonack. Artech House, 2004, 350 pp., £66, ISBN 1-58053-890-8.

Wireless Sensor Networks: A Systems Perspective,
by Nirupama Bulusu and Sanjay Jha. Artech House, 2005, approx. 278 pp., £58, ISBN 1-58053-867-3.

Multicarrier Techniques for 4G Mobile Communications,
by Shinsuke Hara and Ramjee Prasad. Artech House, 2003, 264 pp., £76, ISBN 1-58053-482-11.

Simulation and Software Radio for Mobile Communications,
by Hiroshi Harada and Ramjee Prasad. Artech House, 2002, 414 pp., £76, ISBN 1-58053-044-3.

CDMA Systems Capacity Engineering,
by Kiseon Kim and I. S. Koo. Artech House, 2005, approx. 200 pp., £71, ISBN 1-58053-812-6.

Queueing Theory with Applications to Packet Telecommunication,
by John N. Daigle. Kluwer, 2004, 334 pp., 87.00 Euro/$95.00/£61.00, ISBN 0-387-22857-8.

Principles of Spread-Spectrum Communication Systems,
by Don Torrieri. Kluwer, 2004, 456 pp., 86.00 Euro/$94.00/£60.00, ISBN 0-387-22782-2.

The Handbook of Data Communications and Networks, Second Edition,
by William J. Buchanan. Kluwer, 2004, 2000 pp., 383.00 Euro/$425.00/£264.00, ISBN 1-4020-7741-6.

Secure Group Communications over Data Networks,
by Xukai Zou, Byrav Ramamurthy and Spyros S. Magliveras. Kluwer, 2004, 192 pp., 82.00 Euro/$89.95/£57.00, ISBN 0-387-22970-1.

Interference Avoidance Methods for Wireless Systems,
by Dimitrie Popescu and Christopher Rose. Kluwer, 2004, 152 pp., 73.00 Euro/$80.00/£51.00, ISBN 0-306-48188-X.

Global Mobile Satellite Communications: For Maritime, Land and Aeronautical Applications,
by Stojče Dimov Ilčev. Kluwer, 2004, 490 pp., 131.00 Euro/$145.00/£91.00, ISBN 1-4020-7767-X.

Wireless Communications: Theory and Techniques,
by Asrar U. H. Sheikh. Kluwer, 2004, 774 pp., 144.00

Euro/$160.00/£99.00, ISBN 1-4020-7621-5.

Digital Transmission Systems, Third Edition,
by David R. Smith. Kluwer, 2003, 850 pp., 104.00 Euro/$115.00/£71.00, ISBN 1-4020-7587-1.

Digital Nation: Toward an Inclusive Information Society,
by Anthony G. Wilhelm. The MIT Press, 2004, 161 pp., $27.95, ISBN 0-262-23238-3.

Wireless Communication Standards: A Study of 802.11TM, 802.15TM, and 802.16TM,
by Todor Cooklev. IEEE Press, 2004, 325 pp, $65.00, ISBN 0-7381-4066-X.

Distributed Sensor Networks,
edited by S. Sitharama Iyengar, Richard R. Brooks. Chapman & Hall / CRC, 2004, 1,168 pp., $139.95/£79.99, ISBN 1-58488-383-9.

Global Mobile Satellite Systems: A Systems Overview,
edited by Peter A. Swan and Carrie L. Devieux Jr. Kluwer, 2003, 186 pp., 112.00 Euro/$110.00/£70.00, ISBN 1-4020-7384-4.

Wireless Communications Systems and Networks,
edited by Mohsen Guizani. Kluwer, 2004, 718 pp., 146.00 Euro/$160.00/£101.00, ISBN 0-306-48190-1.

Wireless Sensor Networks,
edited by Cauligi S. Raghavendra, Krishna M. Sivalingam and Taieb Znati. Kluwer, 2004, 442 pp., 114.00 Euro/$125.00/£79.00, ISBN 1-4020-7883-8.

Ad Hoc Networks: Technologies and Protocols,
edited by Prasant Mohapatra and Srikanth Krishnamurthy. Kluwer, 2004, 296 pp., 89.00 Euro/$96.95/£62.00, ISBN 0-387-22689-3.

Workshop Report: NetCod 2005

Raymond Yeung

The First Workshop on Network, Coding, and Applications (NetCod 2005) was held on April 7, 2005 at Riva del Garda, Trentino, Italy, in conjunction with the Third International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt 2005). The keynote speech was given by Jean-Yves Le Boudec, and invited talks were given by Ralf Koetter, Muriel Médard, and Ken Zeger. The rest of the program consisted of 15 submitted presentations. The workshop, providing an opportunity for the network coding and wireless communities to interact with each other, was attended by about 30 researchers from around the world.

Attendees of the First Workshop on Network, Coding and Applications.

DIMACS Working Group on Network Coding

DIMACS Center, Rutgers University, Piscataway, NJ

January 26-28, 2005

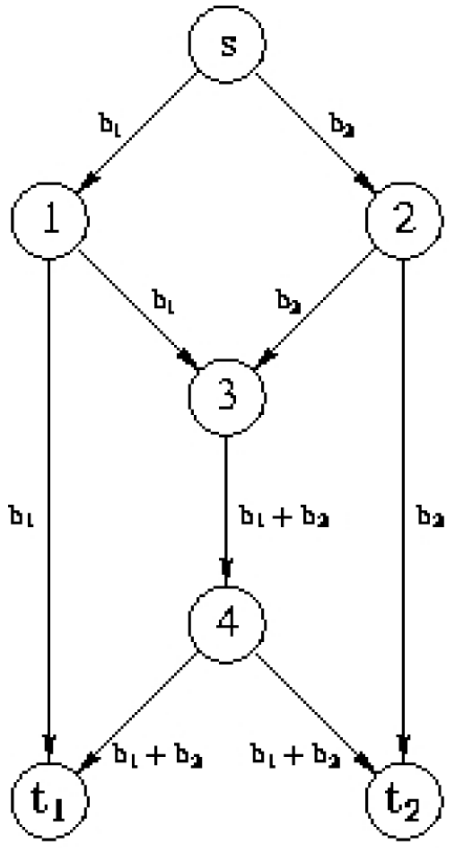
by Piyush Gupta, Gerhard Kramer and Emina Soljanin

A working group on Network Coding was held at the Center for Discrete Mathematics & Theoretical Computer Science (DIMACS) located at Rutgers University, Piscataway, New Jersey. This event was organized by Piyush Gupta, Gerhard Kramer and Emina Soljanin, all of Bell Laboratories, and is part of a series of workshops and working groups being organized under the auspices of the DIMACS 2001-2005 Special Focus on Computational Information Theory and Coding. This program is funded by the National Science Foundation and the New Jersey Commission on Science and Technology.

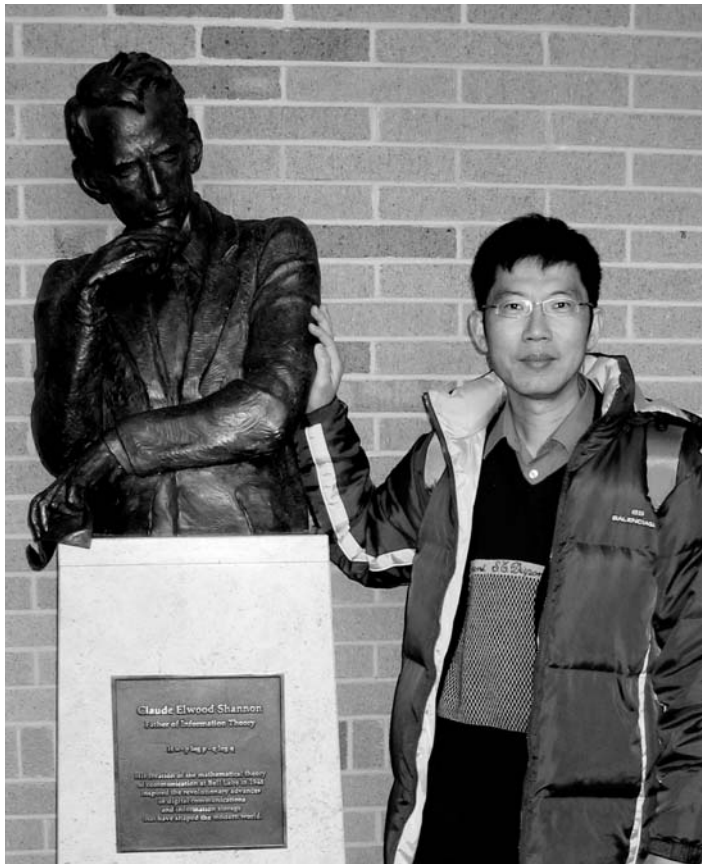
The focus of the workshop was the area of Network Coding that is emerging as a "hot topic" in communications and networking research. Many fundamental results have appeared since the publication of the first papers in the IEEE Transactions on Information Theory. The celebrated min-cut, max-flow theorem states that a source node can send a message through a network to a sink node at a rate determined by the min-cut separating the source and the sink. Surprisingly, one can show that by re-encoding at the nodes, the min-cut rate can also be achieved when multicasting to several sinks. Perhaps just as importantly, recent results have shown that network coding can improve the security and robustness of networks.

This topic has attracted researchers from a broad spectrum of fields including coding, networking and computer science. This is a result of both the interdisciplinary nature of the problems, and the potential impact that network coding may have on the operation of future networks.

This working group consisted of twelve talks by leading researchers in network coding, and was attended by about 30 people. The aim of the workshop was the dissemination of the most recent breakthroughs, and an exchange of ideas to further advance the area. More information on the working group can be found at http://dimacs.rutgers.edu/Workshops/NetworkCodingWG/



The network coder's "coat of arms".



Raymond Yeung posing with the statue of Claude Elwood Shannon at Bell Labs, Lucent Technologies, Murray Hill, NJ.

Applications of Statistical Physics to Coding Theory

Santa Fe, New Mexico

January 10-12, 2005

by Bane Vasic, Misha Chertkov and Ildar Gabitov

A workshop on Applications of Statistical Physics to Coding Theory was organized by M. Chertkov (Los Alamos National Laboratory), I. Gabitov (Los Alamos National Laboratory and University of Arizona, Tucson) and B. Vasic (University of Arizona, Tucson). The workshop was held from January 10 to January 12, 2005 in Santa Fe, New Mexico.

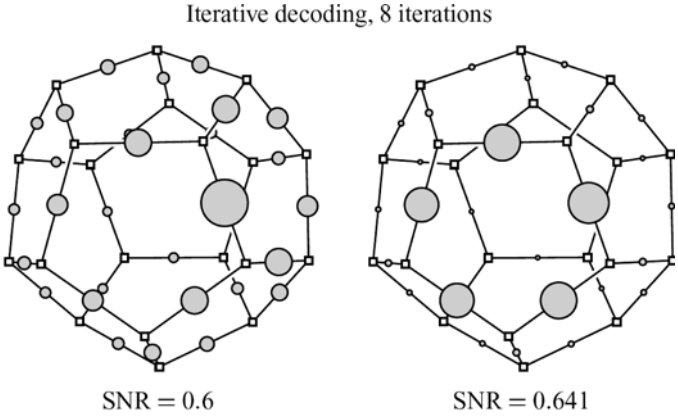
This workshop brought together experts that work on coding theory and statistical physics from a variety of viewpoints. Invited speakers were: Alexei Ashikhmin (Bell-Labs, Alexander Barg (Maryland), Vladimir Chernyak (Wayne State), Richard Hughes (LANL), Yoshiyuki Kabashima (Tokyo Tech), Ljupco Kocarev (UCSD), Ralph Koetter (UIUC), Marc Mézard (Orsay, Paris), Olgica Milenkovic (Boulder), Andrea Montanari (ENS, Paris), Tom Richardson (Flarion), David Saad (Aston), Amin Shokrollahi (EPFL), Paul H. Siegel (UCSD) , Nicolas Sourlas (ENS), Mikhail Stepanov (LANL), Z. Toroczkai (LANL), Martin Wainwright (Berkeley), Jonathan S. Yedidia (Mitsubishi).

The focus of the workshop was a relationship between codes on graphs and spin models (for example it is known that turbo codes correspond to "coupled spin chains", while random LDPC represent "spin models on diluted graphs."). The question that motivated this workshop was to understand how powerful methods of statistical physics can be used to address difficult questions of coding theory, like if an iterative decoding algorithm can reach the threshold of optimum decoding in a finite number of iterations, or if there exists a lower dynamical threshold where the decoding algorithm gets trapped in a locally stable state.

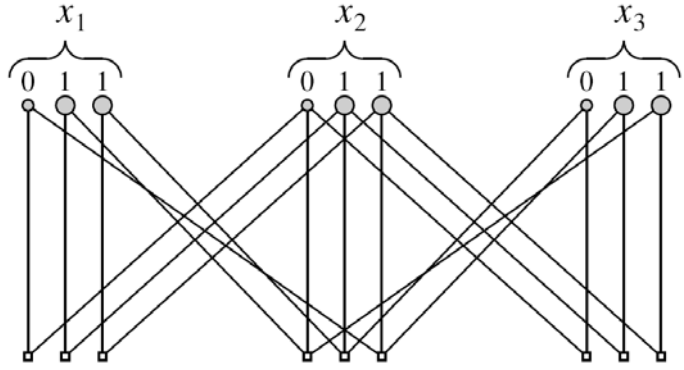
In order to facilitate a synthesis of perspectives, the workshop was organized around half-day sessions followed by active discussions. The workshop started with the topics in exploring relationship between iterative decoding, linear programming relaxations for decoding, pseudo-codewords, codeword polytopes and coding theory and statistical physics methods to characterize iterative decoding and the error performance of codes on graphs. It continued with topics in statistical mechanics approaches to source coding, CDMA multiuser detection, and to difficult computational problems such as determining the capacity of noiseless and noisy two-dimensional channels. Applications of coding theory in quantum key distribution, analysis of flow processing on networks and designing constrained codes for DNA computing were also presented.

The sentiment of the workshop participants was that information theory and statistical physics after many years of following their disjoint paths started converging again very much as in early days of information theory.

More information on the workshop can be found at: http://cnls.lanl.gov/~chertkov/FEC.htm



Example of an instanton noise configuration for a simple code



Pseudo-codeword on 3-cover of a graph .

2005 Australian Communications Theory Workshop

Brisbane, AUSTRALIA

February 2-4, 2005

The sixth Australian Communications Theory Workshop (AusCTW2005)was held 2-4 February 2005 at the University of Queensland in Brisbane, Australia. This annual workshop concentrates on theoretical aspects of physical layer communications, in particular communications and information theory. Specific topics included coded modulation, coding theory and practice, communication systems, channel characteristics and modeling, detection and estimation, digital signal processing for communications, information theory and statistics, iterative decoding algorithms, multiuser detection and space-time coding and processing.

The workshop was generously sponsored by National ICT Australia, Agere Systems, Cohda Wireless, University of Queensland, University of South Australia's Institute for Telecommunications Research, and EmSolutions.

This year 113 people attended the workshop. Presentations included three 40-minute "Research Overview" talks, twelve 20-minute technical talks and three posters sessions (with over 25 posters presented in each session). This year, the overviews were presented by Dr Steve Weller (University of Newcastle) who spoke on "Low Density Parity Check Codes", Dr Kim Blackmore (Australian national University), who spoke on "The Price of Mobility in Ad-Hoc Networks" and Dr John Ness (EmSolutions), who talked about "Wireless Communications: Taking Theory to Practice". The technical talks, given by local and visiting international researchers concentrated in more detail on recent research results. A record of the entire technical program, including poster sessions, may be found on the AusCTW web site, http://www.itee.uq.edu.au/~ausctw05. The AusCTW 2005 student prize winners were Matthew McKay (best poster) and Nick Letzepis (best paper).

The published papers will appear onIEEExplore. The workshop proceedings are also available in hardcopy (ISBN 0-9580345-6-7) and on CD-ROM (ISBN 0-9580345-7-5), and can be ordered by contacting John Homer, homerj@itee.uq.edu.au.

Call for Papers: Forty-Third Annual Allerton Conference on Communication, Control, and Computing

The Forty-Third Annual Allerton Conference on Communication, Control, and Computing will be held from Wednesday, September 28 through Friday, September 30, 2005, 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 Jacob Ziv of the Technion – Israel Institute of Technology, will deliver this year's plenary lecture. It is entitled "What is Hidden in an Individual Sequence" and is scheduled for Friday, September 30, 2005.

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 Friday, July 1, 2005 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 15, 2005, 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: Geir Dullerud and Andrew Singer
Email: allerton@csl.uiuc.edu
URL: http://www.comm.csl.uiuc.edu/allerton

COORDINATED SCIENCE LABORATORY AND THE DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

University of Illinois at Urbana-Champaign

Eighth International Symposium on Communication Theory and Applications (ISCTA '05)

17th – 22nd July, 2005, Ambleside, Lake District, UK

FINAL CALL FOR PAPERS

A major objective of the Symposium will be to pursue the progression from communication and information theory through to the implementation, evaluation and performance of practical communication systems of various types. You are invited to submit original papers in the following and related areas:

Digital Transmission and Recording
Source and Channel Coding
Modulation, Detection, Channel Estimation
Channel Modelling, Synchronisation
Optical and Magnetic Recording

Special Topics in Channel Coding, Source Coding, Information Theory
Turbo Codes, Low Density Parity Check Codes
Source Coding and Data Compression
Privacy, Secrecy and Security
Multi-Functional Coding
Sequences and Arrays

Detection Techniques
Vector Detection, Multiuser Detection
Combined Equalisation, Decoding and Channel Estimation
Iterative (Turbo) Schemes

Ultra Wideband Techniques

Space-Time Techniques
Information-Theoretic Aspects, Channel Capacities
Space-Time-Coding, Signal Constallations
Spatial Spreading, Linear Dispersion Codes
MIMO Detection and Channel Estimation
MIMO Precoding, Writing on Dirty Paper
Time Reversal

Realisation
DSP for Communication Systems
MIMO Demonstrators
Complexity Considerations

Systems, Multiple Access, Protocols
Communication System Architectures
3G and Beyond-3G Wireless Communication Systems
Sensor Networks
Ad Hoc Networks
Multiple Access Techniques, Protocols
Multimedia Networking

The deadline for the submission of papers for consideration is **Friday 4th March, 2005.** Papers should not exceed 6 pages in length, including figures. Please submit your paper to:

Professor Bahram Honary
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Tel: +44 1524 592121
Fax: +44 1524 592713
E-mail: b.honary@lancaster.ac.uk

or

Professor Juergen Lindner
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D-89081 Ulm, Germany
Tel: + 49 73150 26250
Fax: +49 73150 26259
E-mail: juergen.lindner@e-technik.uni-ulm.de

You will be notified of acceptance by **22nd April, 2005**. There will then be an opportunity to revise your paper, taking into account any comments by the referees, and to put it into the required format for the Symposium Proceedings. The deadline for receipt of your revised paper is **20th May, 2005**, so that the Proceedings can be published in time to be made available to all participants at the Symposium.

Organising & Program Committee

Mario Blaum (USA)
Rolando Carrasco (UK)
Michael Darnell (UK)
Pingzhi Fan (PR China)
Paddy Farrell (UK)
Eric Gabidulin (Russia)
Lajos Hanzo (UK)
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Shu Lin (USA)
Garik Markarian (UK)
Mel Maundrell (UK)
Robert McEliece (USA)
Jorge Pereira (Belgium)
Valdemar da Rocha (Brazil)
Han Vinck (Germany)

The Symposium **Venue** is St. Martin's College, Ambleside, Cumbria, UK, where all the presentations, most meals, and social events, will take place. Ambleside is in the famous and very beautiful English Lake District, and there will be opportunities for walks and excursions during the Symposium.

For information on registration fees and accommodation, please consult our website: http://www.hwcomms.com/iscta05.htm or http://www.dcs.lancs.ac.uk

Rinicom Ltd

TURBO - CODING - 2006

4th International Symposium on Turbo Codes & Related Topics

6th International ITG-Conference on Source and Channel Coding

Munich, Germany
3-7 April 2006

General Chair:
J. Hagenauer, TU München, Germany
C. Berrou, ENST Bretagne, France

Technical Program Chair:
J. Huber, Universität Erlangen-Nürnberg, Germany

Publication Chair:
W. Koch, Universität Erlangen-Nürnberg, Germany

Technical program committee:

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G. Fettweis, TU Dresden, Germany
C. Günther, DLR Oberpfaffenhofen, Germany
F.-P. Heider, T-Systems GEI GmbH, Germany
P. Höher, Universität Kiel, Germany
K. Kammeyer, Universität Bremen, Germany
W. Koch, Universität Erlangen-Nürnberg, Germany
B. Lankl, Universität der Bundeswehr, Germany
H.-A. Loeliger, ETH Zürich, Switzerland
M. Jézéquel, ENST Bretagne, France
R. Johannesson, Lund University, Sweden
J. Lodge, CRC Ottawa, Canada
R. Mathar, RWTH Aachen, Germany
P. Noll, TU Berlin, Germany
M. Oerder, Philips GmbH, Germany
J.-R. Ohm, Universität Aachen, Germany
R. Pyndiah, ENST Bretagne, France
W. Rosenkranz, Universität Kiel, Germany
C. Ruland, Universität Siegen, Germany
B. Schmauß, FH Regensburg, Germany
S. Shamai (Shitz), Technion, Israel
W. Stammler, EADS, Germany
J. Thielecke, Universität Erlangen-Nürnberg, Germany
R. Urbanke, EPFL Lausanne, Switzerland
P. Vary, RWTH Aachen, Germany

Local Organization:

J. Hagenauer, TU München, Germany
N. Dütsch, TU München, Germany
C. Günther, DLR Oberpfaffenhofen, Germany
B. Lankl, Universität der Bundeswehr, Germany

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Second Call for Papers

The 4th International Symposium on Turbo Codes & Related Topics, organized by ITG and TUM/LNT (Munich University of Technology, Institute for Communications Engineering), will be held on Monday 3rd - Friday 7th April 2006 at the Bavarian Academy of Sciences and Humanities in Munich, Germany.

The Symposium will be the opportunity to provide a broad overview of the current status and advanced research in iterative methods and their application to information theory, especially for digital communications. The Symposium will include regular papers and poster sessions as well as some invited papers.

The non-exhaustive list below gives possible topics for the papers submitted:

- error correction coding, turbo codes and LDPC codes
- coded and turbo coded modulation
- detection and turbo detection
- equalization and turbo equalization
- synchronization and turbo synchronization
- multi-user detection
- bounds, performance and convergence
- algorithms for constituent codes
- interleaving and graphs
- fountain codes
- network coding

The 6th International ITG Conference on Source and Channel Coding (SCC 06) will be held in connection with the Symposium on Turbo Codes. Some technical sessions will take place in parallel. Papers on the following subjects are welcome for SCC 06:

- information theory
- algebraic coding
- MIMO and CDMA systems
- source coding and data compression
- speech, audio, image and video coding
- joint source and channel coding, error concealment
- cryptography and digital watermarking

As in the previous Turbo Symposium and ITG's SCC Conference, some papers will be selected for publication in an extended version, in a special issue of the *"European Transactions on Telecommunications"* journal.

Submissions

Authors are invited to submit a full 4-page paper before **October 17, 2005**. Only electronic submissions will be accepted. Further details can be found on the Symposium web page **www.turbo-coding-2006.org**

At least one author of the accepted paper must be registered for the Symposium by **January 15, 2006** in order to be published in the proceedings.

Key dates

For information regarding registration, accommodation and transport please check the Symposium website http://www.turbo-coding-2006.org.

Submission of papers deadline:	October 17, 2005
Notification of acceptance:	December 15, 2005
Final versions of papers:	January 15, 2006
Preferential rate registration deadline:	February 15, 2006

http://www.isit2006.org

General co-chairs:
Joseph A. O'Sullivan,
Washington University
John B. Anderson,
Lund University

Program co-chairs:
Alexander Barg,
University of Maryland
Raymond W. Yeung,
The Chinese University of Hong Kong

Local arrangements chair:
Radha Poovendran,
University of Washington

General vice chair:
Anthony Ephremides,
University of Maryland

Treasurer:
Amer Hassan, Microsoft

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Conference Announcement

2006 IEEE International Symposium on Information Theory

Sheraton Hotel and Towers, Seattle, Washington
July 9 – July 14, 2006

The 2006 IEEE International Symposium on Information Theory will be held at the Sheraton Hotel and Towers in Seattle, Washington from Sunday July 9 through Friday July 14, 2006. Seattle is conveniently located on the west coast, making it easily accessible from everywhere in North America and from Asia. This thriving city offers a range of cultural activities. Mountains, Olympic Peninsula, Puget Sound, and Lake Washington offer inspiring recreational opportunities.

Previously unpublished contributions to the following areas will be solicited:

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

Papers will be reviewed on the basis of an extended abstract of sufficient detail to permit reasonable evaluation. In addition to new results in areas that form the core of information theory, efforts will be made to encourage participation by researchers in related fields and researchers working on novel applications of information theory.

Detailed information on paper submission, technical program, accommodation, tutorials, travel, and excursions will be posted on the Symposium web site:
`http://www.isit2006.org`

Princeton University

Call For Papers CISS '06

40TH Annual Conference on Information Sciences and Systems

Department of Electrical Engineering, Princeton University

March 22, 23, and 24, 2006

Authors are invited to submit previously unpublished papers describing theoretical advances, applications, and ideas in the fields of information theory (including application to biological sciences); communication, networking; signal, image, and video processing; systems and control; learning and statistical inference.

Two types of contributed papers are solicited:

- ***Regular papers,*** requiring approximately 30 minutes for presentation; these will be reproduced in full (up to six pages) in the conference proceedings.
- ***Short papers,*** suitable for presentation in approximately 15 minutes; one-page summaries of these papers will be published in the proceedings.

Electronic summaries in Adobe PDF format, together with a "regular" or "short" designation and 2-3 keywords must be submitted by **January 2, 2006** through the conference website http://www.ciss.us. Summaries should be of sufficient detail and length to permit careful reviewing. Authors will be notified of acceptance no later than **February 3, 2006**. Final manuscripts of accepted papers are to be submitted in PDF format no later than **February 24, 2006**. **These are firm deadlines that will permit the distribution of a CD containing the conference proceedings at the Conference.**

PROGRAM DIRECTORS:
Prof. Robert Calderbank
Prof. Hisashi Kobayashi
Dept. of Electrical Engineering
Princeton University

CONFERENCE WEBSITE:
http://www.CISS.us

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IMPORTANT DATES:
Submission deadline:
Monday, January 2, 2006

Notification of acceptance:
Friday, February 3, 2006

Final manuscript and advance registration:
Before Friday, February 24, 2006

Conference dates:
Wednesday, Thursday and Friday
March 22, 23, and 24, 2006

www.ciss.us

Conference Calendar

DATE	CONFERENCE	LOCATION	CONTACT/INFORMATION	DUE DATE
June 5-8, 2005	**Canadian Workshop on Information Theory (CWIT) 2005**	Monteal, Quebec	http://www.ece.mcgill.ca/~cwit2005	February 14, 2005
June 12-15, 2005	**2005 IEEE Communication Theory Workshop**	Park City, Utah	http://www.ece.ualberta.ca/~ctw05/index.html	February 1, 2005
June 17-23, 2005	**Four International Workshop on Optimal Codes and Related Topics 2005**	Pamporovo, Bulgaria	http://www.moi.math.bas.bg/oc2005/oc2005.html	March 31, 2005
July 17-22, 2005	**8th International Symposium on Communication Theory and Applications (ISCTA'05)**	Amblesdie, Lake District, UK	http://www.hwcomms.com/iscta05.htm	March 4, 2005
August 29 - September 1, 2005	**2005 Information Theory Workshop (ITW)**	The Royal Lakeside Novotel Rotorua, New Zealand	http://www.cs.auckland.ac.nz/itw2005	January 31, 2005
Aug. 31 - Sept. 1	**InOWo'05 - 10th International OFDM Workshop 2005**	Hamburg, Germany	http://ofdm.tu-harburg.de See CFP in this issue	April 17, 2005
September 4-9, 2005	**2005 IEEE International Symposium on Information Theory (ISIT)**	Adelaide Convention Center Adelaide, AUSTRALIA	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
September 28-30, 2005	**43rd Annual Allerton Conference on Communication, Control and Computing**	Allerton, Illinois USA	http://www.comm.csl.uiuc.edu/allerton	July 1, 2005
April 3-7, 2006	**4th International Symposium on Turbo Codes and Related Topics**	Munich, Germany	http://www-turbo-coding-2006.org	Oct. 17, 2005
TBA	**2006 IEEE International Symposium on Information Theory (ISIT)**	Seattle, Washington, USA	TBA	TBA