IEEE Information Theory Society Newsletter

President's Column

Bixio Rimoldi

Greetings to all IT Society members and friends of information theory!

It is an honor for me to serve as the president of the IEEE Information Theory Society this year. As many of you know, the IT society has 5 officers that de facto form a 5-year "presidential pipeline": one starts as the second vice president (currently Andrea Gold-smith) and in subsequent years he/she becomes first vice president (Marc Fossorier), president, junior past president (Dave Neuhoff), and senior past president (Steve McLaughlin). We interact very frequently and I am happy to be part of a team that works so well together.

I am particularly grateful to Dave and Steve for the various initiatives they have undertaken as presidents during the past two years and for leaving a clear picture of what needs to be done in the near future. Last year Dave has covered much ground in terms of negotiating win-win agreements with IEEE and with conference organizers. As a result, the Society can become a technical co-sponsor of a conference. This means that the conference proceedings can be included in IEEE Xplore while the conference organizers may retain copyright. Besides becoming more accessible, the proceedings that are included in IEEE Xplore provide a financial benefit to the Society. After a difficult negotiation with IEEE Dave was also able to obtain that the Society be granted a 3-year trial period during which its members will have electronic access to proceedings of conferences sponsored by the Society. Following the recommendation of an excellent report writ-

ten by an ad-hoc committee chaired by Bruce Hajek, Dave also formed a standing conference committee composed of Alex Grant (chair), Dan Costello, Tony Ephremides, Bruce Hajek, and Han Vinck. The Conference Committee will recommend policies for conferences and provide advice and assistance to meeting organizers. In the long run this committee will make a big difference to conference organizers and should significantly streamline the presentations of conference related matters at board meetings. While writing about recent accomplishments, I would like to commend the leadership that Andrea has taken in forming and chairing a very successful Student Committee.

I would like to take the opportunity to thank the members of the Board of Governors whose term expired at the end of 2006, namely John Anderson, Tom Cover, Johannes Huber, and Alex Vardy, and congratulate and welcome our newly elected and re-elected members, namely Dave Forney, Tor Helleseth, Ryuji Kohno, Andi Loeliger, Muriel Médard, Prakash Narayan, and Alon Orlitzky.

Special thanks go to Muriel Médard who's 3-year term as treasurer ended on December 31, 2006. We have been lucky to have someone of Muriel's competence and iron fist during the difficult financial times that started in 2002 when IEEE, in an attempt to correct its financial difficulties, depleted the Society's reserves. Muriel followed Marc Fossorier, and on Jan. 1, 2007, Anant Sahai has taken over. With him I am confident that our "luck" with treasurers will continue.

Finally I would like to thank Alex Vardy and the ad-hoc committee he chaired for their outstanding report on the growth of the Transactions.

From the Editor

Daniela Tuninetti

Dear IT society members,

I hope you had a great start of the year. I would like to start 2007 by thanking our past president Dave Neuhoff. It has been a great pleasure for me to get to know him and work with him for society related matters during the past year. At the same time, I would like to welcome our new president Bixio Rimoldi. I wish him great success in his new office.

In this first issue of 2007 I hope you will enjoy the column of our President Bixio Rimoldi as well as Anthony Ephremides' Historian's column, and Sol Golomb's puzzle. You will also find the announcement of prestigious awards recently won to members of Society, and the list of members nominated IEEE Fellow in 2007. Please join me in congratulating them all for their achievements. In addition, there are reports on ITW 2006 and ISITA 2006, an interesting story about Laveen Kanal, and interesting insider news from program manager Sirin Tekinay at the National Science Foundation. Finally, if you do not know your Shannon number, you will find the answers in this issue.

Please help to make the Newsletter as interesting and informative as possible by offering suggestions and contributing news. The deadlines for the next few issues of the Newsletter are as follows (please notice that the deadlines have been moved forward by about a week with respect to the past):

Issue	Deadline
June 2007	April 10, 2007
September 2007	July 10, 2007
December 2007	October 10, 2007

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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I wish everyone again a happy and proficient 2007. Sincerely,
Daniela Tuninetti

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The Historian's Column

Anthony Ephremides

In the past I have mused frequently over our society's relationship with its soviet counterpart during the Cold War era. Prompted by the recent workshop in Changdu, China, I would like to review our relationship with the Chinese. It has been a very different, much less turbulent, and, perhaps, much more consequential than our dealings with the Soviets.

When Information Theory was born, China was in serious political, economic, and military internal turmoil. It was heuristically closed to most of the rest of the world and there hardly was any communication with the country's scientists. Especially during the dire cultural Revolution period any thoughts about entropy and error correction might result in hard labor in the fields for the purpose of personal fault correction.

But then Nixon went to China (even an opera has been written to dramatize that historic visit), Mao subsequently passed away, the power struggle that ensued was more or less resolved, and, lo-and-behold, in 1979 at the ISIT in Groguanio, Italy, two Chinese professors showed up. It is still unclear who read Shannon's paper first in China and when.. The fact is that by 1979 there had been a sufficient amount of knowledge and interest generated in that vast country. There were discussions between the Chinese delegates and many of our members. The most productive discussion seems to have taken place with Dick Blahut and Toby Berger. They were both invited to visit China and lecture on Information theory for several weeks.

I recall a telegram that had been received in 1981 by the society's president who proceeded to read it to the members of the Board of Governors during a BoG Meeting. It was an enthusiastic account of their experience and it recommended a definite cultivation of contacts with the Chinese. The reaction and level of interest that their lectures generated had apparently exceeded their expectations.

The next thing that happened was the arrival of two Chinese students at Cornell University who had been encouraged to apply for admission to the Ph.D. Program. They were to study under Toby Berger and they were destined to be the pioneers of a long, sustained, and expanded procession of additional students from China who joined colleagues from Hong Kong and Taiwan in populating American and European Universities. One of them is our very familiar Zhen Zhang who has been with the faculty of the University of Southern California since 1988.

The rest is … well, history. Very quickly, at the same staggering pace with which the entire country and its society has been profoundly transformed, Information theory grew into the mainstream of scientific activity in China. There was already a workshop in the outskirts of Beijing (in the Fragremt Hill's Hotel) in 1988 right after the Kobe ISIT in Japan. I still remember an early morning hike to the surrounding hills with Bruce Hajek and Tom Cover leading the way amidst many Chinese hikers who were periodically emitting loud yells and cries of greeting and relaxation.

Another workshop was planned to take place in 2003 in Hong Kong (by then already an integral part of China) following the Yokohama ISIT in Japan. Alas, fears arising from the "bird flu" epidemic that broke out early that year forced the cancellation of that workshop for which Raymond Young (among others) had labored so intensely.

Despite that setback, through the sustained efforts of people like Raymond, Shu Lin, Ping Li, and others, the very successful recent workshop in Chengdu took place finally last Fall. This workshop revealed the depth and breadth of the "hold" that Information Theory has created in China. The majority of the participants were from China and they displayed talent, enthusiasm, and creativity. Dick Blahut reminisced about the sequence of events that culminated in the current healthy growth of Information Theory in China (and by Chinese researchers worldwide). He likened the initiative of Shu Lin's (who had actually instigated the original visit and participation by Chinese delegates in the 1979 ISIT) to the planting of an acorn, that usually grows into a towering and robust oak tree. During the workshop banquet, where Dick made these remarks, we were treated to fantastic performances by diverse artists and, of course, sumptuous Chinese food, washed down with, among other libations, Great Wall Cabernet Sauvignon.

I cannot refrain from adding a personal note that shows how small our vast world sometimes is. Being interested in opera and operatic singing I noted during the banquet performance a young soprano (whose name is Emma) who interpreted some Chinese songs with a bright clarion voice. As it happens there is also an exciting new discovery of a great tenor in the international opera scene, called Yu Qiang Dai. He has only made one recording in the West (consisting of Halian opera arias that he interprets with unbelievable Italienate sound and faultless Italian diction) and he has sung in Tosca at Covent Garden in 2005. He is young and talented and belongs to the pantheon of tenors along with Caruso, DelMonaco, Corelli, Domingo, Pavarotti, and others. So, I thought that in China I might find more recordings by him. I approached Emma during the banquet and asked her whether she knew of this great new tenor. After asking me to spell his name and reflecting, she concluded she didn't. But, about fifteen minutes later she can back with a beaming face. She had talked to her husband (who is an Information theorist (who clarified to her that indeed Qiang Dai Yu (notice the reversal in the sequence of the names) was a colleague of her uncle with whom he had studied music together. In a country of 1.2 billion people I had located a "distance-one" neighbor of Yu Qiang Dai in such an effortless way! Emma brought me the next day additional recordings that he has made in China and she even e-mailed me additional performances by him recently, what a beautiful side-event that matched fittingly this wonderful workshop! Unlike the country's historic "long march" under Mao Zedong, its march into Information theory has been swift and very successful.

IT Members Receive Prestigious Awards

IEEE Eric E. Sumner Award

Michael Luby (Co-Founder and Chief Technology Officer at Digital Fountain) and Amin Shokrollahi (Professor of EECS, EPFL) have received the IEEE Eric E. Sumner Award with the following citation: "For bridging mathematics, internet design and mobile broadcasting as well as successful standardization."

The IEEE Eric E. Sumner Award was established by the IEEE Board of Directors in 1995. It may be presented annually, to an individual or a team of not more than three, for outstanding contributions to communications technology. It is named in honor of Eric E. Sumner, 1991 IEEE President, who retired as Vice President, Operations Planning, AT&T Bell Laboratories after a long and distinguished career.

IET Achievement Award

A senior member of the ITS Iickho Song (Professor of EE, KAIST) received an Achievement Award from the Institution of Engineering and Technology (IET) for his outstanding contribu-

tions in wireless mobile communications at the IET Headquarter, Savoy Place, London, UK, on January 11, 2007. He is the first Korean scholar receiving the award.

Established by merging former Institution of Electrical Engineers (IEE) and Institution of Incorporated Engineers (IIE), the IET is the largest institution in Europe currently having about 150,000 members over 120 nations around the world.

IEEE Signal Processing Society 2006 Best Paper Award

Professor Bin Yu's paper, "Perceptual audio coding using adaptive pre- and post-filters and lossless compression", co-authored with three, Dr. Gerald Shuller of Frauhofer-Institute fur Digitale Medientechnologie, Germany, Dr. Dawei Huang of Bell Labs China, and Dr. Bernd Edler of Leibniz Universitaet Hannover, Germany, has been selected to receive a 2006 Best Paper Award from the IEEE Signal Processing Society. This honor will be presented at Awards at ICASSP2007.

New IEEE Fellows as of January 2007

Name/Affiliation	Society List	Evaluating Society
Peter de With Logica-CMG P.O. Box 7089, Kennedyplein 248 Eindhoven, The Netherlands peter.de.with@logicacmg.com	IT, CAS, CE	CE

for contributions to compression techniques and architecture of television and recording systems

Urbashi Mitra University of Southern California Department of Electrical Engineering, 3740 McClintock Avenue Los Angeles, CA, 99089, USA ubli@usc.edu	IT, COMM, SP	COMM

for contributions to multiuser wideband digital communication systems

Kwang-Cheng Chen National Taiwan University 1, Sec. 4, Roosevelt Road Taipei, 10617, Taiwan chenkc@ieee.org	IT, COMM, SP, VT	COMM

for contributions to wireless broadband communications and wireless local area networks

Christopher Rose Wireless Information Laboratory, Rutgers University Technology Center of New Jersey 671 Route 1 South North Brunswick, NJ, 08902-3390, USA crose@winlab.rutgers.edu	IT, COMM, VT	COMM

for contributions to wireless communication systems theory

Michele Zorzi University of Padua Via Gradenigo 6/A Padua, I-35131, Italy zorzi@dei.unipd.it	IT, COMM, VT	COMM

for contributions in the area of energy efficient protocol design

Shuo-Yen Li The Chinese University of Hong Kong Department of Information Engineering Shatin, NT, Hong Kong, Hong Kong bobli@ie.cuhk.edu.hk	IT	IT

for contributions to network coding and switching theories

Marcelo Weinberger Hewlett-Packard Laboratories 1501 Page Mill Road, MS 1181 Palo Alto, CA, 94304, USA marcelo@hpl.hp.com	IT	IT

for contributions to data compression

Ilya Dumer University of California at Riverside ENGR II, College of Engineering Riverside, CA, 92521, USA dumer@ee.ucr.edu	IT	IT

for contributions to error-correcting codes

Leandros Tassiulas University of Thessaly Computer and Communications Engineering Dept. Volos, 38221, Greece	IT, COM	IT

leandros@uth.gr

for contributions to algorithms, protocols and architectures of wireless communication networks

Thomas Richardson IT, COM IT
Flarion Technologies
135 Route 202/206 South
Bedminster, NJ, 07921, USA
tjr@flarion.com

for contributions to coding theory and practice

Ioannis Pitas IT, BT, C, CAS, CE, COM, GRS, SP SP
Aristotle University of Thessaloniki
Department of Informatics
Box 451
Thessaloniki, 54124, Greece
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for contributions to nonlinear signal and image processing, digital water-marking and biometrics

Marc Moonen IT, CAS, COM, SP, VT SP
Katholieke Universiteit Leuven
Dept. E.E./ESAT
Kasteelpark Arenberg 10
Leuven, 3020, Belgium
marc.moonen@esat.kuleuven.be

for contributions to adaptive filtering algorithms for digital communications and audio signal processing

Antonio Ortega IT, CAS, SP SP
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Department of Electrical Engineering
3740 McClintock Ave, EEB 400, MC 2564
Los Angeles, CA, 90089-2564, USA
ortega@sipi.usc.edu

for contributions to image and video communications

Zhi-Quan Luo IT, SP SP
University of Minnesota
Department of Electrical and Computer Engineering
200 Union Street SE
Minneapolis, MN, 55455, USA
luozq@ece.umn.edu

for contributions to modern optimization and its applications in signal processing and digital communications

Zixiang Xiong IT, SP SP
Texas A&M University
Dept of Electrical and Computer Engineering
College Station, TX, 77843, USA
zx@ece.tamu.edu

for contributions to source and channel coding

Seiichi Sampei IT, COM, SP, VT VT
Osaka University
Dept. of Information and Communications Technology,
Graduate School of Engineering, 2-1 Yamada-oka
Suita-shi, Osaka, 565-0871, Japan
sampei@comm.eng.osaka-u.ac.jp

for contributions to the development of fading compensation and adaptive modulation techniques for wireless communication systems

Workshop Report: The 2006 Information Theory Workshop (ITW 2006), Chengdu, China

Daniel Costello

Following the IEEE Information Theory Workshop (ITW) held in Beijing in July 1988, the ITW'2006 (Chengdu California Garden Hotel, October 22-26, 2006), chaired by Shu Lin, Daniel Costello, and Pingzhi Fan, marks the second time that an ITW has been held successfully in China. The workshop was organized by the Southwest Jiaotong University (SWJTU), and supported by the National Science Foundation of China (NSFC), the US National Science Foundation (US NSF), Qualcomm, and Seagate Technology, among others.

The program committee chaired by Li Ping and Raymond Yeung selected 135 papers of high quality from 286 submitted contributions. The workshop consisted of 4 plenary speeches, 17 invited talks, 90 oral presentations, and 46 posters. The four plenary speeches were "A Unified Approach to Multiterminal Source Coding" by Richard Blahut, "Analog Iterative Decoders: Myth or Reality?" by Sergio Benedetto, "Doubly-Generalized Low-Density Parity-Check Codes" by Marc Fossorier, and "Separation for Source, Channel, and Network Coding" by Ralf Koetter. All papers

ITW'2006 Conference Banquet.

ITW'2006 Opening Ceremony.

were organized into four categories in the proceedings, i.e., plenary speeches, coding theory, multiple access techniques and wireless communications, and information theory and miscellaneous topics.

The event started on the evening of Sunday Oct. 22nd with a reception and concluded at lunchtime on Thursday Oct. 26th, giving the delegates a weekend to go to several World Cultural and Natural Heritage listed sites around Chengdu city, including Jiuzhai Gou, Huanglong National Park, Leshan Giant Buddha, Mountain Emei, Mountain Qingcheng, and Dujiangyan Irrigation System. Other parts of the social program included banquet entertainment, a half day excursion to the Giant Panda Base (Panda Breeding Area), and Sanxingdui Wonder (Ancient City).

For more information on the workshop, including the slides of the four plenary speeches, invited talk titles, and photographs, please visit http://sist.swjtu.edu.cn/imc/itw06/.

Chengdu Giant Panda Base.

Workshop Report: The 2006 International Symposium on Information Theory and its Applications (ISITA 2006), Seoul, Korea

Jong-Seon No

The 2006 International Symposium on Information Theory and its Applications (ISITA 2006) was held on October 29–November 1, 2006, at COEX, Seoul, Korea. The symposium was sponsored by the Society of Information Theory and Its Applications (SITA) and technically co-sponsored by the IEEE Information Theory Society and IEICE. The general co-chairs of the symposium were Hideki Imai and Jong-Seon No and the technical program co-chairs were Habong Chung and Toru Fujiwara.

The series of ISITA symposia was founded by the Society of Information Theory and its Applications (SITA) in 1990. The past symposia were held in Honolulu in 1990, Singapore in 1992, Sydney in 1994, Victoria in 1996, Mexico City in 1998, Honolulu in 2000, Xian in 2002, and Parma in 2004. In the year of 2006, we had the ninth symposium in the beautiful city, Seoul, which has been the capital city of Korea for 600 years and

now is a center of economy, culture, and education, with a population of ten millions.

As IT technologies become more and more pervasive in every aspect of our life, their role has become more important than ever, in achieving reliability, efficiency, and security in transmission and storage of information. Accompanying this, ISITA is expected to play an increasingly important role to contribute to the progress of the IT society.

The technical program committee of ISITA 2006 selected 177 papers of high quality for presentation among 216 submitted papers from 22 countries. Moreover, the committee arranged three plenary talks in the Monday morning, which were

• "Collaboration, Competition, and Cognitive Radio Transmission in Wireless Networks" by Vahid Tarokh

• "WiBro: A Wireless Broadband Technology" by Daehyoung Hong

• "How to Prove the Security of Cryptography" by Tatsuaki Okamoto.

On Tuesday evening, we had a banquet with wonderful Korean traditional music performance.

To conclude, we would like to express our deep gratitude to TPC co-chairs Habong Chung and Toru Fujiwara, TPC members, and Organizing Committee members for their efforts to make a successful ISITA2006. More information about ISITA 2006 including photographs can be found at http://www.isita2006.org.

We are all looking forward to seeing you at the next ISITA 2008 in the beautiful city, Auckland, New Zealand.

Organizing Committee Members of ISITA 2006.

GOLOMB'S PUZZLE COLUMN™

Calculator Magic

Solomon W. Golomb

For these questions, you will need a simple hand-held calculator with a ten-decimal-digit display that has the operations $+, -, \times, \div, x^2$, and $\sqrt{x}$. (In a few cases, it will save time if you can also calculate x^n directly.) The first three questions involve integer answers, without roundoff. The remaining questions want answers rounded to ten significant decimal digits.

1. What is the largest integer n for which the digits of 2^n are all distinct?

2. Consider the values of n^8 for all n with $1 < n < 18$.

   (a) Which of these numbers have all their digits distinct?

   (b) Which of these numbers have their two most significant digits the same (in order) as their two least significant digits?

   (c) Which two values of n^8 have the same three most significant digits *and* the same two least significant digits?

3. Find a five-digit number A, having no 0's among its digits, such that the ten digits of A^2 contain only two *distinct* digits, each occurring more than three times.
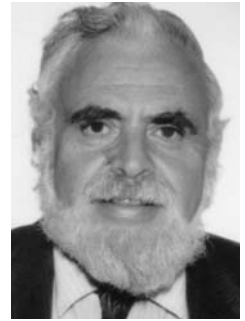
4. What four-digit whole number has a square root which displays all 10 decimal digits?

5. For what value of n does $n/(n+1)$ display all ten decimal digits, in an easily recognized order? (Consider $0 < n < 100$.) What happens when this value of $n/(n+1)$ is multiplied by k, for $0 < k < 10$?

6. Consider the numbers $(10n/9)^2$ for all n, $1 \le n \le 30$, and look at the ten displayed digits.

   (a) For which values of n are all 10 displayed digits the same?

   (b) For which values of n are all 10 displayed digits distinct?

   (c) What patterns do you observe among the 10 displayed digits in part b?

7. Look at the decimal expansion of a/b for $0 < a < b < 30$. Are any of these "pan-digital"? (That is, do you see all ten distinct decimal digits?)

8. Enter 2143. Divide by 22. Take the square root twice. (That is, calculate $(2143/22)^{\frac{1}{4}}$). What do you now see?

Call for Nominations

2007 Information Theory Society Paper Award

The Information Theory Society Paper Award is given annually for an outstanding publication in the fields of interest to the Society appearing anywhere during the preceding two calendar years.

The purpose of this Award is to recognize exceptional publications in the field and to stimulate interest in and encourage contributions to fields of interest of the Society. The Award consists of a certificate and an honorarium of US$1,000 for a paper with a single author, or US$2,000 equally split among multiple authors. The 2006 award will be given for a paper published in 2005 and 2006.

NOMINATION PROCEDURE: By March 1, 2007, please email the name of the paper you wish to nominate, along with a supporting statement explaining its contributions, to the IT Transactions Editor-in-Chief, Vincent Poor, at poor@princeton.edu, with a cc to Lynn Stetson at lstetson@princeton.edu.

2007 Joint ComSoc/IT Paper Award

The Joint Information Theory/Communications Society Paper Award recognizes one or two outstanding papers that address both communications and information theory. Any paper appearing in a ComSoc or IT Society publication during the year 2006 is eligible for the 2007 award. A Joint Award Committee will make the selection.

NOMINATION PROCEDURE: By February 1, 2007, please email the name of the paper you wish to nominate, along with a supporting statement explaining its contributions, to IT Society First Vice President, Marc Fossorier at marc@aravis.eng.hawaii.edu

2007 Information Theory Society Aaron D. Wyner Distinguished Service Award

The IT Society Aaron D. Wyner Award honors individuals who have shown outstanding leadership in, and provided long standing exceptional service to, the Information Theory community. This award was formerly known as the IT Society Distinguished Service Award.

Nominations for the Award can be submitted by anyone and are

made by sending a letter of nomination to the President of the IT Society by April 15, 2007. The individual or individuals making the nomination have the primary responsibility for justifying why the nominee should receive this award.

NOMINATION PROCEDURE: Letters of nomination should: (i) identify the nominee's areas of leadership and exceptional service, detailing the activities for which the nominee is believed to deserve this award; (ii) include the nominee's current vita; and (iii) include two letters of endorsement. Current officers and members of the IT Society Board of Governors are ineligible.

Please send all nominations by April 15, 2007 to IT Society President, Bixio Rimoldi, at bixio.rimoldi@epfl.ch.

IEEE Awards

The IEEE Awards program pays tribute to technical professionals whose exceptional achievements and outstanding contributions have made a lasting impact on technology, society and the engineering profession.

Institute Awards presented by the IEEE Board of Directors fall into several categories (from http://www.ieee.org/web/aboutus/home/index.html, follow "Awards" and the the specific award for which you would like to more information):

Medal of Honor	(Deadline: July 1)
Medals	(Deadline: July 1)
Technical Field Awards	(Deadline: January 31)
Corporate Recognitions	(Deadline: July 1)
Service Awards	(Deadline: July 1)
Prize Papers	(Deadline: July 1)

Of particular interest in the IEEE Technical Field Awards are:
IEEE Leon K. Kirchmayer Graduate Teaching Award
http://www.ieee.org/awards/sums/gradtch.xml, and

IEEE Undergraduate Teaching Award
http://www.ieee.org/awards/sums/ungrad.xml

The Awards program honors achievements in education, industry, research and service. Each award has a unique mission and criteria, and offers the opportunity to honor distinguished colleagues, inspiring teachers and corporate leaders. The annual IEEE Awards Booklet, distributed at the Honors Ceremony, highlights the accomplishments of each year's IEEE Award and Medal recipients.

The IEEE establishes Joint Awards with National Societies in other countries to recognize individuals who have made significant technical, educational or service contributions to the engineering profession or to society in general. See http://www.ieee.org/portal/pages/about/awards/JANS/jans.html.

The IEEE also recognizes outstanding individuals through special membership categories:

IEEE Fellow (deadline: March 1, 2007, see http://www.ieee.org/web/aboutus/fellows/fellows.html), and IEEE Honorary Member (deadline: July 1, 2007, see http://www.ieee.org/portal/pages/about/awards/noms/honrnom.html).

Nominations are initiated by members and the public, then reviewed by a panel of peers and professionals who are especially knowledgeable in a particular field. Their recommendations are submitted to the IEEE Awards Board prior to ultimate approval by the IEEE Board of Directors.

Other IEEE organizations also recognize specific technical and professional achievement through other awards programs, please refer to http://www.ieee.org/portal/pages/about/awards/othawd.html.

Forward questions/comments/suggestions related to the IEEE Awards nomination process to: awards@ieee.org.

Named Professorship to honor Laveen Kanal, IEEE Life Fellow and early IT Transactions Associate Editor for Pattern Recognition.

Mr. Christopher Darnell of Grantham, Mayo, Van Otterloo & Co. LLC located in Boston, Massachusetts has generously made possible the establishment of the Darnell/Kanal Professorship in Computer Science at the University of Maryland in College Park, Maryland. asked to "connect the dots" to his decision he sent in the following statement:

"I first met Laveen Kanal in 1981 when I was beginning my career in quantitative investment management. I had been discouraged with the failure of traditional statistical methods to analyze financial market data characterized by a low signal-to-noise ratio. After reading some of the early papers by Professor Kanal in the new field of statistical pattern recognition, I called Laveen--out of the blue--to see if he would be willing to talk to me. He said he would be delighted to talk and invited me down to Maryland.

In person Laveen was charming, enthusiastic, and patient, and he gave me some great suggestions for using new analysis methods to analyze financial data. Laveen was not only a pioneering thinker and researcher but also a great motivator. While up the road at Princeton Burton Malkiel was publishing the influential Random Walk Down Wall Street, Laveen was convincing me that new methods in mathematics and computer science would someday prove the "efficient market" hypothesis incorrect.

Laveen was right. With his encouragement, I became part of a new generation of investment professionals that used quantitative methods to prove the academics wrong. Over the next 20 years I was the chief architect of many successful global investment products at the investment firm GMO in Boston. Today I am on the Board of Directors of GMO, which now manages $130 Billion for sophisticated clients around the world. I also manage GMO's hedge fund

group that uses advanced methods in mathematics and computer science to trade global securities. While funding a new professorship at Maryland may be unusual for a non-alum, I think it is even more remarkable that Professor Kanal genuinely welcomed and donated time to me, a complete stranger with no connection to the University. Even though Maryland is now one of the world's leading research institutions, I hope that the next generation of Laveen Kanals will follow his example of intellectual openness and mentoring. Although it took 25 years for me to repay Maryland's computer science department, I am deeply satisfied to be able to support and thank the department and the university, and to recognize and repay my debt to an outstanding individual."

Currently, Laveen Kanal holds the title of Professor Emeritus. Laveen joined the department in July 1970 as a world renowned computer scientist in pattern recognition. He remained as a full-time faculty member until his retirement in December 1995. During these years, he was the recipient of many prestigious international and national research awards and was a mentor to both undergraduate and graduate students. Prof. Kanal is an IEEE, AAAS, and AAAI Fellow and received the King-Sun Fu Award from the International Association for Pattern Recognition in 1992. This is the highest award given by that Association. Since that time Laveen has continued his involvement in the scientific community.

GOLOMB'S PUZZLE COLUMN™
THE 3X+1 PROBLEM

Solomon W. Golomb

Recall that for each positive odd integer n, we deine $M(n) = (3n+1)/2^k$, where 2^k is the highest power of 2 which divides $3n+1$. (Therefore $M(n)$ is again odd.)

1. Starting with $n = 27$, the sequence $\{n, M(n), M^2(n), M^3(n),...\}$ is {27, 41, 31, 47, 71, 107, 161, 121, 91, 137, 103, 155, 233, 175, 263, 395, 593, 445, 167, 251, 377, 283, 425, 319, 479, 719, 1079, 1619, 2429, 911, 1367, 2051, 3077, 577, 433, 325, 61, 23, 35, 53, 5, 1}.

2. The numbers in Q, the set of positive odd integers having no predecessors with respect to M, are precisely the multiples of 3. Since $M(n) = (3n + 1)/2^k$, this can not equal $3t$, for then $3n + 1 = 3t \cdot 2^k$ for some positive integer k, which is impossible modulo 3. (That no other positive odd integers are in Q follows from the solution to problem 4. below.)

3. If and only if $t = (2^r - 1)/3$ with even r, i.e. $t = (4^s -1)/3$, we have $M(t) = 1$. (Thus these to f predecessors of 1 is {1, 5, 21, 85, 341,...}.) These are precisely the odd numbers t with $3t + 1 = 2^k$.

4. Any positive odd integer not a multiple of 3 is either of the form $6v - 1$ or $6v + 1$. Then, $2^k (6v - 1) = 3 \cdot 2^{k+1} \cdot v - 2^k$ is of the form $3n + 1$ for every odd k (so that $- 2^k \equiv +1 \pmod 3$, and $2^k (6v + 1) = 3 \cdot 2^k + 1 \cdot v + 2^k$ is of the form $3n +1$ for every even k (so that $2^k \equiv + 1 \pmod 3$). From this, every positive odd integer not a multiple of 3 has infinitely many predecessors with respect to M.

5. From 2. and 4. above, if a positive odd integer n had "parents" (predecessors with respect to M) but no "grandparents", it would be a non-multiple of 3 all of whose predecessors would have to be multiples of 3. It is easyto show from 4. above that among the infinitely any predecessors of such an n, not all can be multiples of 3.

6. Suppose $M(M(n)) = n$ with odd $n > 1$. Then $\frac{3(\frac{3n+1}{2^k})+1}{2^l} = n$, giving $2^k + 3 = (2^{k+1} - 9) n$ with $k \geq 1, l \geq 1, n \geq 3$, and $k + l \geq 4$ in order for the right side to be positive. Under these conditions, the left side, $2^k + 3$, will always be less than the right side, $(2^{k+1} - 9)n$, and equality can not occur.

Reference. An excellent summary of what is known about the 3X + 1 problem is "The 3X + 1 Problem and Its Generalizations" by Jerey C. Lagarias, AMERICAN MATHEMATICAL MONTHLY **92** (1985), pp. 3-23.

What's Your Shannon Number?

Andrew W. Eckford
York University, Toronto, ON, Canada

Paul Erdõs, the great mathematician, was a fantastically prolific author of papers, having around 1500 authorships or coauthorships to his credit. In an informal recognition of his large and influential body of work, mathematicians informally use the Erdõs number to represent their "degree of separation" in authorship from Erdõs. Supposing a graph is drawn of all authors, with a vertex corresponding to each author, and an edge between two vertexes if the two corresponding authors have coauthored a paper, an author's Erdõs number is the number of edges in the shortest path between themselves and Erdõs (or infinity if no such path exists).

Of course, one could "recenter" the graph away from Erdõs and onto any other individual. For instance, we could recenter the graph on Shannon and talk about a "Shannon number". (I should point out that the terminology "Shannon number" is already in use in some more serious contexts, e.g., [1].)

I have often wondered how "separated" my work is from Shannon's, and how the field of information theory has developed to the point where I can find a niche to do my own research. The Shannon number, at first glance, gives an informal measure of the "largeness" of the information theory community, and helps us to understand how far Shannon's ideas have progressed. Furthermore, they help us understand our own connections to the community: is small "distance" a good predictor of successful collaboration? Should I be trying to write papers with people who are at distance two from me? (Or, what's the least separation between me and another author until the probability is high that I no longer understand what they are talking about?)

There is a problem with the Shannon number as a direct analog of the Erdõs number, which is that Shannon's collected works [2] are less voluminous than those of Erdõs by an order of magnitude. With a very generous count that includes coeditors (given below), Shannon had only 25 immediate collaborators, compared to over 500 for Erdõs. Most crucially, Shannon himself has an Erdõs number of 3 (through E. R. Berlekamp and J. H. van Lint); therefore, anyone with a finite Erdõs number also has a finite Shannon number, which is at most three larger. As a result, this number as a metric of "closeness" to the roots of information theory (even an informal one) has a big drawback: the metric can be overwhelmed by very prolific authors (such as Erdõs) who are only incidentally connected to information theory. For example, my own Erdõs number is smaller than my Shannon number.

I can think of a couple of modifications to the simple "Shannon number" to tune the graph into something more useful. Firstly, there is the "Directed Shannon number": we would draw a directed edge between Shannon and all his coauthors, where each directed edge would have a date stamp corresponding to the date of their earliest collaboration. Then we would draw directed edges from those authors to their coauthors, again with date stamps,

excluding all those coauthors that predated the collaboration with Shannon. This would be carried on recursively so as to only connect authors with an outgoing edge that do not predate the first incoming edge. As a result, the graph acquires a notion of "causality", measuring (informally) how Shannon's ideas percolated through the community. However, given that many people use ideas through citation, without being a coauthor, this grouping might be unnecessarily small. (On the other hand, we could use citations, but Shannon himself might not have been impressed with using citations of his work as a measure of the information theory community [3]).

An alternative might be the "Strong Shannon number". In this case, we would only draw an edge between authors if their joint authorship was in a journal where Shannon himself published. Thus, all authors would be excluded except those who publish in IRE/IEEE Transactions on Information Theory, Proceedings of the IRE/IEEE, Journal of Mathematics and Physics (now called Studies in Applied Mathematics), Information and Control (now called Information and Computation), and a few others. This has the advantage of including only publications in journals that are (mostly) appropriate for research in information theory.

Other, possibly more formal, alternatives may be found in the field of collaboration graphs, which studies phenomena of connectedness in social networks (a good review may be found in [4]).

Whatever the definition used, these numbers are excellent for idle amusement value. Since first being introduced to Erdõs numbers, I have spent a few afternoons going through collaboration search engines, one of which is given below, to find Erdõs and Shannon numbers of myself and various other luminaries in the field. And we should remember that these numbers are just for fun: there's no reason to believe that a small Shannon number correlates with research success, attractiveness to potential mates, value as a human being, or anything else.

To find your Shannon or Erdõs number:

First, go to: http://www.ams.org/mathscinet/searchauthors.html

Do an author search for yourself. If you appear in the database, a menu will appear when you float the mouse cursor over your name. Click on "Collaboration distance", then click the "Use Erdõs" button, or enter "Shannon, Claude Elwood", or enter any other researcher, as appropriate. Since not every publication is in the database, this is an upper bound on your "number"; you may want to check some of your coauthors to see if they have a number that is two or more smaller than yours.

To my knowledge, there is no way to check a variant of the Shannon number without doing the hard work yourself.

Shannon's collaborators (from [2]):

J. Riordan, W. Feller, B. Oliver, R. Blackman, H. Bode, B. Holbrook, C. Dolph, J. Pierce, J. Tukey, W. Weaver, E. Cherry, S. Moss, Uttley, I. Good, W. Lawrence, W. Anderson, E. Moore, D. Hagelbarger, J. McCarthy, K. de Leeuw, N. Shapiro, P. Elias, A. Feinstein, R. Gallager, E. Berlekamp.

Acknowledgements

The author wishes to thank Profs. Yongyi Mao of the University of Ottawa and Steve Hranilovic of McMaster University for encouraging him to write this article.

References

[1] A. Stern and B. Javidi, "Shannon number and information capacity of threedimensional integral imaging," J. Opt. Soc. Am. A, vol. 21, no. 9, pp. 1602—1612, Sep. 2004.

[2] C. E. Shannon, Collected Papers, ed. N. J. A. Sloane and A. D. Wyner, Piscataway, NJ: IEEE Press, 1993.

[3] C. E. Shannon, "The Bandwagon," IRE Transactions on Information Theory, vol. 2, no. 2, p. 3, Mar. 1956.

[4] M. E. J. Newman, "The structure and function of complex networks," SIAM Review, vol. 45, pp. 167—256, 2003.

Guest Column: News from the Communications Program at the National Science Foundation

by Sirin Tekinay, Program Director

Dear reader,

This is the sixth column in this series- the calendar has flipped through its second year since I joined the NSF. I'm glad that this space has been serving its purpose of fueling our interaction on ideas, visions, and issues that impact us all as professionals in the communications community as I write about relevant NSF programs and news.

I continue to enjoy our close interaction, which helps me do my job as your program officer in Washington. By the time this article appears, I'll need to make a decision about extending or staying with my current appointment at the NSF; as I will complete my second year in September. A rotator's appointment such as mine can be extended up to four years, by renewing yearly appointments. I look forward to hearing your thoughts about this, especially if you would consider a post at the NSF.

New and Upcoming Solicitations

At the time of writing, our Theoretical Foundations 2007 (TF07)[1] Program is within its window of submission. The deadline is February 19, 2007. The deadline is set such that it is at least ninety days away from the date the solicitation is posted. The window for proposal submission is the thirty-day period before the deadline.

I continue to serve as the representative of our directorate on the Interdisciplinary Graduate Education Research Traineeship (IGERT) program coordination committee. At the time of writing, IGERT 2006 is about to reach a conclusive set of awardees. IGERT 2007 program solicitation was also posted recently. The deadlines for pre-proposals and invited full proposals are, March 5, and October 5, respectively.

News on Communications Research

TF07, much like last year's solicitation, specifies three research areas;

• Science for Internet's Next Generation (SING),

• Science for Computing,

• Science for Communications.

SING was introduced last year. Its scope is decidedly more focused this year, on the interaction related aspects of the Internet such as the theory of networking, theory of networked computing, large scale wireless networking.

I am hopeful that next year SING will become a CISE-wide program, cutting across all three divisions of the directorate [3]. This will ensure the broad scope that the program deserves, along with the financial and human resources it needs, beyond the Theoretical Foundations Cluster.

In TF07, a researcher can be an investigator on only one proposal: this limit was introduced last year. Next year, the limit is likely to go up to two.

The reason for our delayed deadline (May 25, 2006) of TF06 was that we wanted to be able to have access to 2007 funds that would become available on September 30, 2006, still within the six-month "proposal dwell time" we aim to make decisions. However, NSF, along with other federal agencies, is still under "continuing resolution;" i.e., we are not given a full budget allocation for 2007. In the absence of a full picture of the program budget, it is a daunting, and often frustrating task to make funding decisions on good proposals set aside for potential awards. The double edge sword we're faced

with is the problem of delayed decisions with the next cycle coming up so soon. The suboptimal solution was to decline many good proposals with a note of encouragement to re-submit with modifications, hopefully with the added benefit of panel reviews.

I continue to serve as my division's (CCF) representative to the GENI program. My primary objective is to establish SING and other communications related theoretical research as integral parts of GENI research portfolio [4].

I prioritized the CAREER awards in the face of an unknown budget. While it is one of the most difficult selection processes, I am proud of the five awards I was able to extend to extraordinarily talented young researchers that have come up with most creative research and education plans for the next five years of their lives. As with all awards, the abstracts of these exciting plans are available on NSF's website with award search capability.

On a Personal Note

Supporting workshops and symposia has proven to be a cost efficient way of making a difference: well focused, intimate events with few parallel tracks are prioritized over large scale, well established conferences in getting NSF support. The support is typically in the form of travel awards to women and underrepresented minorities. I am proud to have sponsored, albeit, at a token level, the Information Theory and Applications Workshop [5]. I was delighted to be invited to give a brief talk on NSF's new programs and initiatives within this workshop in San Diego. The personal care of the experienced, ever enthusiastic organizers has resulted in a successful, most enjoyable event.

NSF People

In every column, I introduce some of the people I work with; who embody the culture and spirit of NSF. This time I will introduce one scientific, one administrative staff, each filling the shoes of folks I introduced to you in earlier columns:

Professor J. Wu has assumed the role of Program Director in the wireless side of NeTs cluster, replacing Professor David Goodman [6]. Jie comes to us from Florida. He's a distinguished professor with most recent contributions to sensor networking. We're delighted to have him as an excellent colleague, who's also soft spoken, fun, a true joy to work with.

Ms Dawn Patterson is helping us as program assistant, temporarily replacing Ms Laurin Battle, my right arm. Laurin had

a baby girl on January 22, Monday! While I can't wait for her to get back, Dawn has hit the ground running: she has already efficiently processed pending awards, cleaning the slate for the incoming proposals in February. I'm happy to report Dawn will stay on our admin staff even after Laurin comes back in March.

The "Social Scene"

Dr. Peter Freeman has left NSF, after his four-year tenure as the Assistant Director for CISE. His farewell party early in January was punctuated with many giggles as colleagues shared anecdotes about him, and occasional sighs amongst teary-eyed farewells. Peter's impact on the computing and engineering research speaks for itself. His vision, contributions, and ever-energetic dedication make him a lead-by-example type captain. Another well-known (but maybe less so) fact about Peter, though, is that he has been wearing a bow tie every single day the last few decades. In tribute to his signature bow-tie attire, not only did most of us adorn ourselves with this rare neckwear, but we also presented him with an NSF logo patterned bow tie, to add to his collection.

Once again, the speedy Acela train is slowing down pulling into the beautiful Washington Union Station, so I'll end this column here.

… Till next time, dream big, and keep in touch!

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REFERENCES:

[1] http://www.nsf.gov/pubs/2007/nsf07525/nsf07525.htm

[2] http://www.nsf.gov/pubs/2007/nsf07540/nsf07540.htm

[3] http://www.nsf.gov/dir/index.jsp?org=CISE

[4] www.geni.net

[5] http://ita.ucsd.edu/index.php

[6] http://www.cse.fau.edu/~jie/

CALL FOR PAPERS

Special Issue of the *IEEE Transactions on Information Theory* on
Information Theoretic Security

A special issue of the *IEEE Transactions on Information Theory* will be devoted to the exciting research field of Information Theoretic Security. Cryptographic systems that are currently employed in practice are predominantly based on unproven mathematical assumptions such as the assumed infeasibility of factoring large integers and finding discrete logarithms over large finite fields. Advances in cryptanalytic attack algorithms and new computing technologies such as quantum computers may eventually render these systems insecure and obsolete in the future. As such, among both information security researchers and practitioners there has long been a sense of urgency to investigate novel encryption and authentication systems that do not rely for their security on unproven mathematical assumptions. The past two decades have witnessed a number of significant developments in information theoretic security, including the discovery of unconditionally secure encryption schemes, authentication codes and signature methods, and the development of quantum key distribution protocols.

This special issue will focus on research efforts in all major areas in Information Theoretic Security including encryption, authentication, signature, key distributions, information sharing and quantum cryptography. High quality research papers, expository articles, survey papers, and correspondence items pertaining to all aspects of Information Theoretic Security are solicited. Specific topics include, but are not limited to, the following:

- Theoretical and practical topics concerning information theoretic security
- Paradigms, approaches and techniques concerning information theoretic security
- Information theory applicable to information security
- Applications of information theory to computational security
- Topics in the bounded storage model and the noisy channel model
- Quantum information theory applicable to information security
- Quantum cryptography

Further information on guidelines and instructions for submissions can be found at the following web site:

http://www.isac.uncc.edu/ITS-special-issue

Schedule:

Extended Submission Deadline:	February 16, 2007
Acceptance Notification:	December 15, 2007
Final version due:	February 15, 2008
Publication:	June 2008

Guest editorial board:

Hideki Imai,	University of Tokyo, Japan
Ueli Maurer,	ETH Zurich, Switzerland
Yuliang Zheng,	University of North Carolina at Charlotte, USA

XI INTERNATIONAL SYMPOSIUM ON PROBLEMS OF REDUNDANCY IN INFORMATION AND CONTROL SYSTEMS
02 – 06 July, 2007
Saint Petersburg

First announcement

The XI Symposium "Problems of redundancy in information and control systems" will be organized in the period from July 02, 2007 to July 06, 2007. It will take place on the board of the comfortable motorship "Saint-Petersburg" cruising by the rivers Neva and Svir, lakes Ladoga and Onega, which are the pearls of the Russian North-West region.

The work of the Symposium will be organized in the form of the following workshops:

1. **COMPUTATIONAL SYSTEMS AND NETWORKS**

2. **DATA TRANSMISSION SYSTEMS AND NETWORKS**

3. **METHODS OF DATA PROTECTION**

4. **SOFTWARE SYSTEMS**

5. **MULTIMEDIA SYSTEMS**

The participation cost amounts to 750 euro: this includes the registration contribution, speech thesis publishing, accommodation on board of the motorship, meals, excursions and cultural activities during the cruise. For accompanying person the cost amounts to 600 euro.

Papers will be reviewed on the basis of an extended abstract of sufficient detail to permit reasonable evaluation. Final papers will be not more five pages in length (see instructions to authors on web site).

Important dates:
April 1, 2007: deadline for extended abstract submission (http://k36.org/redundancy2007/)
May 1, 2007: deadline Registration Form submission (e-mail: int@aanet.ru)
May 1, 2007: notification of acceptance
May 16, 2007: final paper upload deadline

ORGANIZING COMMITTEE OF THE INTERNATIONAL SYMPOSIUM
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PROGRAMME COMMITTEE OF THE INTERNATIONAL SYMPOSIUM
web site: http://k36.org/redundancy2007/
e-mail: redundancy2007@vu.spb.ru

2007 IEEE Information Theory Workshop on Information Theory for Wireless Network

July 1 – 6, 2007

Bergen, Norway

First call for papers

The workshop will be focused on information theory for wireless networks. Wireless networks present some of the most difficult challenges to information theorists. At the same time, wireless applications in some form provide, worldwide, the strongest economic motivational factor for information theoretic research.

Topics

In order to take advantage of the workshop format and to bring together researchers with related and complementary expertise, we will select the topics of ITW 2007 to be more closely interrelated and to be related to the area of wireless networks. The topics which will be considered are

- Space-time codes and cooperative relay networks

- Error-control for wireless communication: Forward error correction or ARQ?

- Network coding for wireless communication

- Low correlation sequences and streamciphers

Workshop format

The workshop will consist of a mixture of tutorials and invited and submitted talks. We anticipate approximately six to seven invited talks for each topic, including one of tutorial nature. We hereby solicit submissions of papers within these research areas. Papers in related areas may be accepted at the discretion of the program committee.

Organization

General chair:
Øyvind Ytrehus, University of Bergen,

Program co- chairs:
Tor Helleseth, University of Bergen, P. Vijay Kumar, IISc Bangalore

Program committee:
Invited speakers

Time

ITW'2007 will be held the week following ISIT 2007, which is organized in Nice, France (and also the week after ICC'2007), so that non-Europeans can profit from the relative proximity of Nice and Bergen. Moreover, this is an ideal time to visit Bergen and Norway.

Important dates

- Deadline for submission of papers: Friday, March 16, 2007. Submission procedure to be announced later.

- Notification of acceptance of submitted papers: Monday, April 30, 2007.

CALL FOR PAPERS
2007 IEEE INFORMATION THEORY WORKSHOP
Lake Tahoe, California, USA
September 2-6, 2007

General Co-Chairs:
William Ryan
Krishna Narayanan

TPC Co-Chairs:
Zixiang Xiong
Amir Banihashemi

Treasurer:
Tolga Duman

Program Committee:
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Fady Alajaji
Keith Chugg
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Suhas Diggavi
Dariush Divsalar
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Aria Nosratinia
Sandeep Pradhan
Thomas Richardson
Henry Pfister
Igal Sason
Serap Savari
Vladimir Stankovic
Pramod Viswanath
Pascal Vontobel
Richard Wesel
Xiaolin Wu
Lizhong Zheng

Publications:
Sandeep Pradhan

Web site:
Jean Francois Chamberland
Paula Evans

The 2007 IEEE Information Theory Workshop (ITW 2007) will take place on September 2-6 in Lake Tahoe, California, USA, at the Granlibakken Conference Center and Lodge. The theme of the workshop will be **Research Frontiers in Coding** with emphasis on theoretical and practical aspects of source and channel coding and their applications to diverse areas. Prospective authors are encouraged to submit original papers in the following areas:

Source coding (lossless and lossy compression, universal coding)
Channel coding, codes on graphs and iterative decoding
Distributed source and channel coding, joint source-channel coding
Cooperative communications and coding
Coding for wireless systems
Coding for sensor networks and ad-hoc networks
Network coding
Decoder design
Applications of coding to biology, computer science, and other areas

In addition to two plenary talks and two tutorials, the workshop will include invited talks, contributed talks, and contributed posters, all of which will appear in the CD-ROM proceedings. Contributions by authors new to the information theory community are particularly encouraged. Manuscripts of up to 6 pages (in the ISIT format) should be emailed to Zixiang Xiong (zx@ece.tamu.edu) or Amir Banihashemi (ahashemi@sce.carleton.ca) by **April 1, 2007** following the guidelines on the workshop web page. Authors will be notified of acceptance decisions by **May 25, 2007**. The final version, to be published in the workshop proceedings, will be due by **June 25, 2007**. Information on the final manuscript format can be found on the workshop web page.

Information regarding the technical and social programs, final manuscript format, workshop registration, and hotel accommodations will be posted on the workshop website at: http://www.ece.tamu.edu/itw2007/ . Inquiries on general matters related to the workshop should be addressed to:

Prof. William Ryan (ryan@ece.arizona.edu)
Dept. of Electrical and Computer Engineering
University of Arizona
Box 210104, Tucson, AZ 985721 U.S.A., Tel. (520)621-8690

IEEE

Ninth International Symposium on Communication Theory and Applications (ISCTA '07)
16th - 20th July, 2007, Ambleside, Lake District, UK

LANCASTER
UNIVERSITY

Second Call for Papers
Supported by the IEEE Information Theory UK RI Chapter

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
Fountain, LT, etc. codes

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

Broadband Techniques
Ultra Wideband
Fixed Wireless Access

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

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, wireless e-learning, e-commerce and e-health

Realisation
DSP for Communication Systems
MIMO Demonstrators
Complexity Considerations
Implementation of LDPC decoders

Fusion of Communication and Location
GNSS-based
Probabilistic algorithms
Applications

The deadline for the submission of papers for consideration is Friday 2nd March, 2007. Papers should not exceed 6 pages in length, including figures. Please submit your paper to:

Professor Bahram Honary
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Lancaster University
Lancaster LA1 4YR UK
Tel: +44 (0) 1524 510398
Fax: +44 (0) 1524 510493
E-mail: b.honary@lancaster.ac.uk

or

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Tel: + 44 (0)191 222 7332
Fax: +44 (0)191 222 8180
E-mail: r.carrasco@ncl.ac.uk

You will be notified of acceptance by 20th April, 2007. 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 18th May, 2007.

Organising & Program Committee

Bahram Honary (UK)	Mario Blaum (USA)	Rolando Carrasco, UK (Technical Chair)
Michael Darnell (UK)	Pingzhi Fan (PR China)	Paddy Farrell (UK)
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Javier Garcia-Villalba (Spain)	Han Vinck (Germany)	Tad Wysocki (Australia)
Izzat Darwazeh (UK)	George Kolev (Russia)	Nigel Wall (UK)

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/iscta07.htm or http://www.dcs.lancs.ac.uk

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SPWC 2007

Signal Processing for Wireless Communications Workshop

London   6 – 8 June 2007

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University of London

IEEE UKRI Communications Chapter

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University of Surrey, UK

SPWC-2007 CALL FOR PAPERS

SPWC workshop is the premier wireless communication and signal processing event hosting speeches from some of the most prominent researchers in academia and industry.

The 5th annual IEEE and IEE co-sponsored SPWC workshop will be held at King's College London, UK, on 6 – 8 June 2007. You are invited to submit papers in all areas of signal processing, wireless communications, networks, and applications. The topics include, but are not limited to, the following:

- Source-channel coding, space-time coding
- Iterative signal Processing
- Wireless channel modelling and channel parameter estimation
- Signal processing issues in UWB
- Signal processing issues in ad-hoc and sensor networks-power limited signal processing
- Signal processing issues in WLAN and Cellular networks
- Information-theoretic bounds in wireless communications
- Synchronisation
- Cross-layer design in wireless communications; Physical-MAC-Network layers
- Adaptive modulation and coding- radio resource allocation
- Location determination
- Distributed signal processing
- Signal processing and Capacity enhancement
- Wireless transceiver design and optimisation
- Interference suppression and source separation
- Multi-carrier systems

Tutorial

802.11n (Wi-Fi)   **Nambi Seshadiri**
Chief Technology Officer, Broadcom, US

802.11e (WiMAX)   **Arogyaswami Paulraj**
Stanford University, US
Chief Technology Officer, Beceem Communications Inc., US

IMPORTANT DATES

Extended summary (max 2 pages) or full paper due: 28 January 2007
Acceptance notification: 30 March 2007
Full camera-ready paper due: 29 April 2007

http://www.spwc2007.org
info@spwc2007.org

PREVIOUS SPEAKERS

F. Adachi, *Tohoku University, Japan*, **A. Bahaei**, *National Semiconductor, US*, **C. Berrou**, *Technopôle Brest Iroise, France*, **E. Biglieri**, *Politecnico Di Torino, Italy*, **A. Burr**, *University of York, UK*, **G. Caire**, *University of Southern California, US*, **G. Charbit**, *Nokia, UK*, **A. Goldsmith**, *Stanford University, US*, **L. Hanzo**, *Southampton University, UK*, **B. Honary**, *Lancaster University, UK*, **H. Imai**, *University of Tokyo, Japan*, **R. Kohno**, *Yokohama National University, Japan*, **Y. Nuevo**, *Nokia, Finland*, **A. Paulraj**, *Stanford University, US*, **V. Poor**, *Princeton University, US*, **S. Shamai**, *Technion Institute of Technology, Israel*, **B. Suter**, *US Air Force Research Laboratory, US*, **V. Taorkh**, *Harvard University, US*, **S. Verdu**, *Princeton University, US*, **M. Vetterli**, *Ecole Polytechnique Fédérale de Lausanne, Switzerland*.

http://itwinterschool07.eurecom.fr

Information Theory Winter School 2007

La Colle sur Loup, Provence Alpes Cote d'Azur, France

Following a tradition started over 16 years ago by Han Vinck and Rolf Johanesson, a winter school on information theory will take place at la Colle sur Loup (Nice, France) from the 12th to the 16th of march 2007 (http://itwinterschool07.eurecom.fr/index.html).

The main purpose of the school is to provide an opportunity for students and researchers from different universities to meet and interact on different research subjects. Each morning, senior speakers will give special courses on selected topics. In the afternoon, participants will interact with senior researchers in special working sessions. At the moment, we are happy to welcome the following speakers:

- Prof. Giuseppe Caire, University of Southern California, USA
  Title: Joint Source Channel Coding.
- Prof. Eitan Altman, INRIA Sophia-Antipolis, France.
  Title: Game Theory for Wireless Networks.
- Prof. Aris Moustakas, National and Capodistrian University of Athens, Greece
  Title: Applications of Statistical Mechanics to Information Theory.
- Dr. Olivier Dousse, Deutsche Telecom Laboratories, Germany.
  Title: Connectivity and Capacity in Multi-hop Wireless Networks.
- Prof. James Massey, Copenhagen, Denmark
  Title: Zero error

For organizing interesting special working sessions, we ask all participants to send a proposal i.e a one page abstract either on on-going research or an open problem that is of interest to the community. Note that researchers can participate without having their proposal accepted.

The number of participants at this workshop is limited. Priority will be given to early registrations.

Important dates:
15th of January 2007: declaration of intent to participate (send email to: corinne@i3s.unice.fr)
31st of January 2007: Early registration deadline
31st of January 2007: submission of one-page abstracts

Winter School Committee:

Organization:
Prof. Eitan Altman – INRIA
Prof. Pierre Comon - I3S/CNRS
Prof. Merouane Debbah - Eurecom/CNRS
Prof. Raymond Knopp - Eurecom/CNRS
Ephie Deriche - INRIA
Dany Sergeant - INRIA

Registration & Web:
Corinne Julien - I3S/CNRS
Raul de Lacerda – Eurecom/CNRS

Conference Calendar

DATE	CONFERENCE	LOCATION	CONTACT/INFORMATION	DUE DATE
March 14-16, 2007	**Conference on Information Sciences and Systems (CISS 2007)**	The Johns Hopkins University, Baltimore, MD, USA	http://ciss.jhu.edu/	January 3, 2007
April 16-20, 2007	**5th Intl. Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt-2007)**	Limassol, Cyprus	http://www.wiopt.org/	October 16, 2007
April 22-25, 2007	**2007 IEEE 65th Vehicular Technology Conference VTC2007 (VTC 2007 Spring)**	Dublin, Ireland	http://www.ieeevtc.org/ vtc2007spring/index.php	closed
May 6-12, 2007	**2007 IEEE Conference on Computer Communications (INFOCOM 2007)**	Anchorage, AK, USA	http://www.ieee-infocom.org/2007/	August 1, 2006
May 20-23, 2007	**2007 IEEE Communication Theory Workshop (CTW 2007)**	Sedona, AZ, USA	http://www.ece.utah.edu/~ ctw2007/	March 15, 2007
June 17-20, 2007	**IEEE International Workshop on Signal Processing Advances for Wireless Communications (SPAWC 2007)**	Helsinki, Finland	http://wooster.hut.fi/spawc07/	January 26, 2007
June 24-28, 2007	**2007 IEEE International Symposium on Information Theory (ISIT 2007)**	Nice, France	http://www.isit2007.org/	January 8, 2007
June 24 – 28, 2007	**2007 IEEE International Conference on Communications (ICC 2007)**	Glasgow, Scotland, UK	http://www.comsoc.org/ confs/icc/2007/index.html	September 25, 2006
July 1-6, 2007	**2007 IEEE Information Theory workshop for Wireless Networks (ITW 2007)**	Bergen, Norway	http://www.selmer.uib.no/ ITW2007.html	March 16, 2007
July 15-20, 2007	**9th International Symposium on Communication Theory and Applications (ISCTA '07)**	Ambleside, Lake District, UK	http://www.hwcomms.com/ iscta07.htm	TBA
August 29-30, 2007	**12th International OFDM-Workshop 2007 (InOWo'07)**	Hamburg, Germany	http://ofdm.tu-harburg.de	April 13, 2007
Sept. 2-6, 2007	**2007 IEEE Information Theory Workshop (ITW 2007)**	Lake Tahoe, CA, USA	http://www.ece.tamu.edu/itw2007/	April 1, 2007
Oct. 1-3, 2007	**2007 IEEE 65th Vehicular Technology Conference VTC2007 (VTC 2007 Fall)**	Baltimore, MD, USA	http://www.ieeevtc.org/ vtc2007fall/index.php	Feb. 10, 2007
Nov. 26-30, 2007	**2007 IEEE Global Communications Conference (GLOBECOM 2007)**	Washington D.C., USA	http://www.comsoc.org/ confs/globecom/2007/	March 15, 2007