

- [Magazine Main Page](#)
- [Society News](#)
- [Conference News](#)
- [Publication News](#)
- [TC News](#)
- [Chapter and DL News](#)
- [Industry News](#)
- [New Theses](#)
- [New Books](#)
- [In-Depth Reports](#)
- [About SPM eNews](#)
- [Submission Instruction](#)
- [e-Newsletter Team](#)



# IEEE Signal Processing Magazine

[PDF Version](#) [April 2007 Issue](#)

## SPM e-Newsletter

May 2007

- |                                   |                                 |                                  |                             |                                     |
|-----------------------------------|---------------------------------|----------------------------------|-----------------------------|-------------------------------------|
| <a href="#">Society News</a>      | <a href="#">Conference News</a> | <a href="#">Publication News</a> | <a href="#">TC News</a>     | <a href="#">Chapter and DL News</a> |
| <a href="#">Industry/Standard</a> | <a href="#">New PhD Theses</a>  | <a href="#">New Books</a>        | <a href="#">Job Portals</a> | <a href="#">In-Depth Reports</a>    |

### Highlights of This Issue

- [Society News](#): Oppenheim and Gersho honored with prestigious IEEE Awards
- [Conference News](#): Signal Processing Meets Aloha - ICASSP 2007 Held in Hawaii
- [Journal and Cfp](#): Check out SPS journals' Cover and Table of Contents in PDF format
- [TC News](#): Exclusive Report from the Multimedia Signal Processing Technical Committee
- [Distinguished Lectures](#): Check out upcoming SPS Distinguished Lectures near you
- [Chapter News](#): Chapter Chair Meeting held; Activity reports from Northern Virginia
- [Standard & Industry News](#): Exclusive Reports on Mobile TV standardization and DRM consortium
- [New PhD Theses](#), [New Books](#), and [Scholarship/Post-doc Opportunities](#)

[PDF Version](#)

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## 1. Society News

### Oppenheim Awarded the IEEE Jack S. Kilby Signal Processing Medal

[Alan V. Oppenheim](#), Ford Professor of Engineering at the Massachusetts Institute of Technology, was selected by the IEEE to receive the 2007 IEEE Jack S. Kilby Signal Processing Medal "for visionary leadership and exceptional contributions to the field of digital signal processing." The award consists of a gold medal, bronze replica, certificate and honorarium. The Medal will be presented to Dr. Oppenheim at the IEEE Honors Ceremonies; he received a special recognition plaque from the IEEE Signal Processing Society during the ICASSP 2007, marking his selection of this distinguished honor.

IEEE Signal Processing Magazine recently featured Dr. Oppenheim in its [Leadership Reflection](#) column in [November 2006](#). Interested readers may also learn about "From Frequency to Quefrequency: A History of the Cepstrum" by Oppenheim and Shafer from the [DSP History](#) column in the [September 2004](#) issue.

The IEEE Jack S. Kilby Signal Processing Medal was established in 1995 and may be presented "for outstanding achievements in signal processing." The achievement may be theoretical, technological or commercial. The Medal is named in honor of Jack S. Kilby. His innovation was a monumental precursor to the development of the signal processor and digital signal processing.

Nomination forms for the next year's IEEE Jack S. Kilby Signal Processing Medal are now available and due on 1 July. Check [online](#) for more information.

### Gersho Received the IEEE James L. Flanagan Speech and Audio Processing Award

The 2007 IEEE James L. Flanagan Speech and Audio Processing Award is being presented to [Allen Gersho](#), Professor Emeritus of the University of California, Santa Barbara. IEEE selected Dr. Gersho to receive the award, "for contributions to the theory and application of speech coding." The award was presented on April 17, 2007, at the opening ceremony of the IEEE Signal Processing Society's flagship conference, the International Conference on Acoustics, Speech, and Signal Processing (ICASSP), held in Honolulu, Hawaii.

The IEEE James L. Flanagan Speech and Audio Processing Award was established in 2002. It is presented for an outstanding contribution to the advancement of speech and/or audio signal processing to an individual or a team of not more than three. The award was founded and is sponsored by the IEEE Signal Processing Society, and is administered through the Technical Field Awards Council of the IEEE Awards Board. The award consists of a bronze medal, certificate and honorarium.

For more information about SPS awards, visit <http://www.ieee.org/organizations/society/sp/awards.html> .

[Back to Top](#)

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## 2. Conference News

### Signal Processing Meets Aloha – ICASSP 2007 Held in Hawaii.

The 32nd IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) was held in Honolulu, Hawaii, on April 15-20, 2007 [<http://www.icassp2007.org/>]. ICASSP is the world's largest and comprehensive technical conference focused on signal processing and its applications. This year is the first time in ICASSP's three decade history that it was held in Hawaii, the heart of the Pacific Rim. Over 1800 attendees from 42 countries came to Honolulu to attend ICASSP. Learn more from this [special in-depth report](#) about ICASSP 2007, where Signal Processing meets Aloha.

SPS Conference Call-for-Paper & Deadlines	Location	Date	Tutorial/ Special Session	Submission Deadline
<a href="#">IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA'07)</a>	New Paltz, NY	Oct 21-24, 2007		<b>May 18, 2007</b>
<a href="#">International Packet Video Workshop (PV'07)</a>	Lausanne, Switzerland	Nov 12-13, 2007		<b>May 15, 2007</b>
<a href="#">IEEE International Workshop on Computational Advances in Multi-channel Sensor Array Processing (CAMSAP'07)</a>	U.S. Virgin Islands	Dec 12-14, 2007		<b>June 1, 2007</b>
<a href="#">IEEE Automatic Speech Recognition and Understanding Workshop (ASRU'07)</a>	Kyoto, Japan	Dec 9-13, 2007	Sept. 24, 2007 (demo)	July 16, 2007
<b>NEW!</b> <a href="#">International Symposium on Communications, Control and Signal Processing (ISCCSP'08)</a>	St. Julians, Malta	March 12-14, 2008		Oct. 1, 2007
<b>NEW!</b> <a href="#">IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP'08)</a>	Las Vegas, NV	March 31 - April 4, 2008	Aug. 17, 2007 (special session) Nov. 9, 2007 (tutorial)	Oct. 5, 2007

Upcoming SPS Conferences	Location	Advanced Registration	Conference Dates
<a href="#">IEEE International Workshop on Genomic Signal Processing and Statistics (GENSIPS'07)</a>	Tuusula, Finland		June 10-12, 2007
<a href="#">IEEE Workshop on Signal Processing Advances in Wireless Communications (SPAWC'07)</a>	Helsinki, Finland	<b>May 15, 2007</b>	June 17-20, 2007
<a href="#">IEEE International Conference on Multimedia &amp; Expo (ICME'07)</a>	Beijing, China	<b>June 1, 2007</b>	July 2-5, 2007
<a href="#">IEEE Workshop on Statistical Signal Processing (SSP'07)</a>	Madison, WI	TBA	Aug. 26-30, 2007
<a href="#">IEEE International Workshop on Machine Learning for Signal Processing (MLSP'07)</a>	Thessaloniki, Greece	July 2, 2007	Aug. 27-29, 2007
<a href="#">IEEE International Conference on Image Processing (ICIP'07)</a>	San Antonio, TX	TBA	Sep. 16-19, 2007
<a href="#">IEEE International Workshop on Multimedia Signal Processing (MMSP'07)</a>	Chania, Crete	TBA	Oct. 1-3, 2007
<a href="#">IEEE Conference on Signal Processing Systems (SIPS'07)</a>	Shanghai, China	July 31, 2007	Oct. 17-19, 2007

[Back to Top](#)

### 3. Publication News

Upcoming Deadlines for **Signal Processing Magazine**: <http://www.ieee-spm.org/?i=cfp>

- Special Issue on [Spoken Language Technology](#): white paper due **1 June 2007**
- Special Issue on [Visual Cultural Heritage](#): white paper due 1 July 2007
- [SPM Columns/Forums](#) rolling submission deadlines

### Special Issue Deadlines of SPS Transactions

- Special issue on "[New Approaches to Statistical Speech and Text Processing](#)" - Deadline: **15 June 2007**.  
(Transactions on Audio, Speech and Language Processing)
- Special issue on "[Multimedia Applications in Mobile/Wireless Context](#)" - Deadline: 31 July 2007.  
(Transactions on Multimedia)

### Journal of Selected Topics in Signal Processing (JSTSP) - A new SPS journal:

J-STSP is a new journal of the IEEE Signal Processing Society that emphasizes emerging technical areas within the discipline. The first issue of the journal will appear in June, and will be on the topic of "Adaptive Waveform Design for Agile Sensing and Communication." Other special issues with open submission dates are:

- "[MIMO-Optimized Transmission Systems for Delivering Data and Rich Content](#)" - Deadline: 15 July 2007
- "[Genomic and Proteomic Signal Processing](#)" - Deadline: 1 September 2007

For more information on submitting papers to these special issues, or how to propose a topic for the journal, please visit the J-STSP website: <http://www.ece.byu.edu/jstsp> . Inquiries can be addressed to Prof. A. Lee Swindlehurst, *Editor-in-Chief* (Brigham Young University, UT, USA), Email: [swindle AT ee.byu.edu].

### Recent Issues of SPS Sponsored and Co-sponsored Publications

IEEE Signal Processing Magazine (vol. 24, no. 3: [Contents](#))

**Special Issue on Bootstrap Methods in Signal Processing**

Interview with Dr. Zadeh on Fuzzy Logic

Columns on Processing on GPUs and DSP Software Optimization

IEEE Transactions on Audio, Speech and Language Processing (vol. 15, no.4: [Table of contents](#); [Xplore](#))

IEEE Transactions on Image Processing (vol. 16, no.5: [Table of contents](#); [Xplore](#))

IEEE Transactions on Information Forensics and Security (vol. 2, no.1: [Table of Contents](#); [Xplore](#))

IEEE Transactions on Signal Processing ([vol. 55, no.5](#): Table of Contents for [Part 1](#) and [Part 2](#) )

IEEE Signal Processing Letters (vol. 14, no.5: [Table of Contents](#); [Xplore](#))

IEEE Transactions on Medical Imaging ([vol. 26, no. 5](#))

IEEE Transactions on Mobile Computing ([vol. 6, no. 6](#))

IEEE Transactions on Multimedia ([vol. 9, no. 3](#))

IEEE Sensors Journal ([vol. 7, no. 5](#))

IEEE Transactions on Wireless Communications ([vol. 6, no. 4](#))

Computing in Science & Engineering Magazine ([vol. 9, no. 2](#))

IEEE MultiMedia ([vol. 14, no. 2](#))

[Back to Top](#)

## 4. TC News

### Multimedia Signal Processing (MMSP) Technical Committee

The IEEE Multimedia Signal Processing (MMSP) Technical Committee promotes the advancement of multimedia signal processing technology with special emphasis on the interaction, coordination, synchronization, and joint processing of multimodal signals. The MMSP TC serves the technical membership of the IEEE Signal Processing Society in a number of ways, including organization of conferences and workshops, award nominations, and supporting related journals. Learn more about the MMSP effort through this [exclusive in-depth report](#).

[Back to Top](#)

## 5. Chapter News and Distinguished Lectures

**Do you know?** IEEE SPS provides travel support for local chapters to invite **SPS Distinguished Lecturers**. See [a list of 2006 and 2007 SPS DLs](#), and check below for upcoming **SPS Distinguished Lectures** near you.

Chapter	Dates	SPS Distinguished Lectures
<b>Toronto, Canada</b>	14-May-2007	Aggelos K. Katsaggelos: "Recent Advances in Image and Video Recovery" ( <a href="#">announcement</a> )
<b>Greece</b>	5-14 June, 2007	Giorgios Giannakis: "Distributed Estimation Using Wireless Sensor Nets" (5-Jun-2007) and "Wireless Cooperative Communications" (14-Jun-2007) Contact: [thanos AT ee.upatras.gr]
<b>Turkey</b>	7-12 June, 2007	At METU Informatics Institute, Ankara (contact: yardimy AT ii.metu.edu.tr) · Giorgios Giannakis: "Distributed Estimation Using Wireless Sensor Nets" (7-Jun-2007) · Luis Torres: "Face Detection and Recognition" (8-Jun-2007)  At Eskisehir Anadolu University (contact: atalaybarkan AT anadolu.edu.tr) · Giorgios Giannakis: "Wireless Cooperative Communications" (11-Jun-2007) · Luis Torres: "Distributed Video Coding" (12-Jun-2007)
Chapter	Dates	Other Upcoming Events
<b>Long Island, NY</b>	15-May-2007	Shervin Erfani (SUNY Farmingdale): <a href="#">"The Laplace and Fourier Transform: A Personal Perspective"</a>

<b>Northern Virginia &amp; Washington</b>	15-May-2007	Dr. Vasiliki Ikonomidou (National Institutes of Health): " <a href="#">The Application of a New Magnetic Resonance Imaging Technique, Tissue Specific Imaging, to Brain Imaging in Multiple Sclerosis</a> ." Co-sponsored with Engineering in Medicine and Biology Society
<b>Central Texas</b>	17-May-2007	Brent Hodges (ZigBee Alliance): "ZigBee Wireless Sensor and Control Networks," at 7pm, AT&T (formerly SBC) Labs. Contact the <a href="#">Joint Comm/SP chapter</a> at [scrowl AT ieee.org]
<b>Baltimore, MD</b>	22-May-2007	Dr. Sanjeev Khudanpur (Johns Hopkins Univ.): "Recognize Speech v/s Wreck a Nice Beach: The Mathematics of Automatic Speech Recognition" at 6pm, Historical Electronics Museum (HEM), 1745 W. Nursery Road, Linthicum, MD 21090, tel 410-765-0230. RSVP <ronald_aloysius AT ieee.org>.

## Annual IEEE SPS Chapter Chair Meeting

The annual Signal Processing Society Chapter Chairs Meeting was held on April 19, 2007 during ICASSP 2007. Representative from about 12 local chapters in North and South America, Europe, and Asia attended the meeting organized by Dr. Alex Kot, Chair of the SPS Chapters Committee. Dr. Kot presented updates on IEEE SPS's support to local chapters, including streamlined financial support through the Distinguished Lecturer Program. He also suggested local chapters to encourage local IEEE student chapters to integrate the Distinguished Lecturer Program as part of the local IEEE student chapters activities. Chapter representatives shared their experiences in organizing events and discussed various potential avenues for further improvement.

If you are interested in organizing a new SPS chapter, or participating activities in a SPS local chapter near you, please check out [Local Chapter Resources](#). Additional questions and comments can be addressed to the [SPS Chapters Committee](#).

## IEEE SPS Chapter Activities at A Glance - Northern Virginia Chapter

The Northern Virginia Signal Processing Society Chapter (NoVA SPS) has several exciting technical seminars planned for 2007, which cover a broad spectrum of topics in signal processing. The chapter events are posted on the [NoVA SPS website](#), along with other interesting activities and officer information of the NoVA SPS chapter. Previous technical seminars covered topics on radar signal processing, estimation theory, statistical signal processing, acoustical signal processing, and image processing. The NoVA SPS chapter also actively co-sponsors events with several IEEE chapters in the northern Virginia and Washington sections, including an upcoming talk on May 15 (see the list of upcoming events above). Contact Chapter Chair Dr. Tim Settle at [Timothy.F.Settle AT saic.com].

[Back to Top](#)

## 6. Standard/Industry News

### Standardization Efforts for Mobile TV Services

Mobile TV targets bringing TV-like services to mobile phones. However, mobile phones nowadays differ significantly from traditional TV equipments, for example, they integrate two-way communication network connections and flexible operating systems as well as powerful hardware platforms allowing smart software applications. This provides the possibility that mobile TV users can enjoy personalized and interactive TV with content specifically adapted to the mobile medium. In addition to traditional live TV channels, mobile TV delivers a variety of services including video-on-demand and Mobile TV pod casts, where content is delivered to a user's mobile on-demand or by subscriptions. Learn more about the standardization effort of Mobile TV from the [in-depth report](#).

## Turning the Page on Digital Rights Management

Digital Rights Management (DRM) technologies have been, still are, and likely will be a heavily debated topic among all parties in the content value chain, from creation, through aggregation and distribution to consumption. These DRM technologies enable content owners to control the way in which professional content is being distributed and consumed, and potentially create new business models. From an end-user point of view, however, DRM technologies have not wholeheartedly been embraced. An often heard argument states that DRM technologies restrict the fair use of content.

The Coral Consortium is a large cross-industry group that aims to build better technical solutions that will allow for a better user experience. The Consortium is working to provide a standardized DRM-data exchange protocol that will enable collaborating services and devices to seamlessly move content and associated meta-data around in appropriately defined eco-systems. Learn more about this on-going industrial effort from the [in-depth article](#).

[Back to Top](#)

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## 7. New PhD Theses

**Alexandre G. Ciancio** (University of Southern California):

**"Distributed Wavelet Compression Algorithms for Wireless Sensor Networks,"** December 2006.

Advised by Prof. Antonio Ortega.

This thesis addresses the problem of compression for wireless sensor networks (WSNs). The goal is to have a reconstructed version of the sampled field at a central node, with the sensors spending as little energy as possible. We propose a distributed wavelet algorithm which exploits the natural data flow in the network to aggregate data by computing partial wavelet coefficients that are refined as the data flows towards the central node. We also introduce a framework where the network is represented as a graph and use dynamic programming techniques to optimize the coding, assigning different coding schemes to each of the nodes so that the overall energy cost is minimum. The main contribution of this work is not only to provide a decorrelation algorithm for WSNs, but one that is cost-aware, and flexible enough to adapt to the different requirements and limitations of any individual network.

[Click here](#) to download the dissertation, or contact the author at <aciancio AT gmail.com>.

**Yinian Mao** (University of Maryland, College Park):

**"Securing Multi-Layer Communications: A Signal Processing Approach,"** August 2006.

Advised by Prof. Min Wu.

The development in wireless communications, networking technology, and embedded systems has led to numerous emerging applications whose security requirements are beyond the framework of conventional cryptography. This dissertation research aims at developing new approaches to the emerging security problems in communication systems, without unduly increasing the complexity and cost of the entire system. For example, we have proposed atomic encryption operations for multimedia data that can protect confidentiality, preserve standard compliance, and are friendly to communications and delegate processing. In cooperative wireless communications, we have discovered the threat of signal garbling attack from compromised relay nodes in the emerging cooperative communication paradigm, and proposed a countermeasure to trace and pinpoint the adversarial relay. This dissertation demonstrates that the fusion of signal processing, cryptography, and other technical disciplines can take place at every layer of a secure communication system to strengthen system security and improve performance-security trade-off.

[Click here](#) to download the dissertation, or [contact the author](#).



**Interested in submitting or recommending a recent Ph.D. thesis?**

Please prepare the following material and email Associate Editor at <piva AT lci.det.unifi.it>:

- (1) thesis author's information (full name, contact, current affiliation, URL if available), Ph.D granting institution, thesis advisor's name and contact information;
- (2) title, URL, and a short summary of the thesis (100-150 words); and
- (3) an email from the thesis advisor confirming that the author has already successfully defended the Ph.D. thesis and that a final version of the thesis has been officially submitted according to the Ph.D. degree requirements of the author's institution.

[Back to Top](#)

**8. New Books*****Embedded Image Processing on TMS320C6000 DSP:***

***Examples in Code Composer Studio and Matlab***, Shehrzad Oureshi, Springer 2005.

[Book Description from Mathworks](#): Written for practicing signal and image processing engineers, this book discusses the implementation of advanced image processing algorithms on resource-constrained embedded DSP systems. Topics covered include spatial processing techniques, image filtering, edge detection, and wavelets. MATLAB is used throughout the book to solve application examples. In addition, the Link for Code Composer Studio, the Image Processing Toolbox, and the Wavelet Toolbox are introduced and used to solve relevant examples.

Check out the [in-depth book review](#) in the upcoming SPM May 2007 issue.

***Speech Recognition Over Digital Channels***, Antonio M. Peinado and Jose C. Segura, Wiley, July 2006.

[Book Description based on Publisher's Input](#): Automatic speech recognition (ASR) is a very attractive means for human-machine interaction. The degree of maturity reached by speech recognition technologies during recent years allows the development of applications that use them. In particular, ASR shows an enormous potential in mobile environments, where devices such as mobile phones or PDAs are used, and for Internet Protocol (IP) applications. *Speech Recognition Over Digital Channels* offers a complete system comprehension, addressing the topics of distributed and network-based speech recognition issues and standards, the concepts of speech processing and transmission, and system architectures and robustness. This book will appeal to a wide-ranging audience: engineers using speech recognition systems, researchers involved in ASR systems and those interested in processing and transmitting speech such as signal processing and communications communities. It will also be of interest to technical experts requiring an understanding of recognition over mobile and IP networks, and postgraduate students working on robust speech processing.

Visit the [book's website](#) for detailed Table of Contents and ordering information.

**New Books Featured in April '07 eNews [\[details\]](#)**

*Multidimensional Signal, Image and Video Processing and Coding*, John W. Woods, Academic Press, 2006.

*MIMO Wireless Communications*, E. Bilgieri, A. R. Calderbank, A. G. Constantinides, A. Goldsmith, A. Paulraj and H. V. Poor (eds), Cambridge, UK: Cambridge University Press, 2006.

*Multimedia over IP and Wireless Networks – Compression, Networking and Systems*, M. van der Schaar, P. Chou (eds), Elsevier, 2007.

[Back to Top](#)



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## 9. Research Opportunities

### **Vice Chancellor's Strategic Research PhD Scholarship Victoria University of Wellington, New Zealand**

Research area: Blind Source Separation Algorithm Development for Passive Foetal Heartbeat Detection

Institution: School of Chemical and Physical Sciences, Victoria University of Wellington, New Zealand.

Application Deadline: 13 July 2007. Application forms are available [online](#).

Blind Source Separation (BSS) is currently a very active research area. This is the development of signal processing techniques capable of separating signals from signal mixtures with knowledge of neither the signals nor the mixing processes. Such mixtures occur, for example, in communications, audio, and medical imaging. This project is aimed primarily at the development of BSS algorithms and techniques. Specific applications areas are separating foetal heartbeat signals (acoustic or electrical) from maternal heartbeat signals and separating brain (EEG) signals from muscle signals (EMG). Other application areas in communications and acoustics are available if these are of more interest to the student. The primary research focus is on the development of both optimal and robust approaches for separation of the signals of interest, and on identification of the fundamental properties of these signals that make such approaches desirable. A good foundation in mathematics and signal processing is required.

Research contact: Dr. Paul Teal, School of Chemical and Physical Sciences, Telephone +64-4-463 5966, Email: [paul.teal AT vuw.ac.nz]. Application contact: Philippa Hay, Scholarships Manager, Victoria University of Wellington, PO Box 600, Wellington, New Zealand, Telephone +64-4-463 7493, Email: [philippa.hay AT vuw.ac.nz]. [Click here](#) to learn more about scholarship opportunities at VUW.

### **Post-doc positions in Network Science Army Research Laboratory (ARL), Adelphi, MD, USA**

ARL seeks highly qualified candidates for post-doctoral research positions in the area of Network Science, with application to mobile ad hoc and wireless sensor networks. Applicants should have a Ph.D. in Electrical Engineering, Computer Science, Mathematics or Physics, or related field, with expertise in wireless networking theory and / or advanced simulation and modeling. US citizenship is required.

Application materials should include (a) cover letter with a brief statement of research interests, (b) full CV with a list of publications, (c) contact information for three references. For further information, please contact Dr. Ananthram Swami [aswami AT arl.army.mil] and Dr. Brian M. Sadler [bsadler AT arl.army.mil].

### **Job Posting Portals**

<http://careers.ieee.org/>

<http://jobs.phds.org/jobs/engineering/>

[http://engineering.academickeys.com/seeker\\_job.php](http://engineering.academickeys.com/seeker_job.php)

[Back to Top](#)

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### **Contributors of articles in this issue:**

Ingemar Cox, Ton Kalker, Thomas Stockhammer, Anthony Vetro, Mark Watson, and ICASSP 2007

committee.

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## About SPM e-Newsletter

Since April 2007, the IEEE Signal Processing Magazine has introduced a new form of publication - a Monthly Electronic Newsletter. The e-Newsletter will complement the bi-monthly Magazine to serve the members in the IEEE Signal Processing Society (SPS). Through email notification and expanded coverage on its website, the e-Newsletter will provide members with timely updates on:

- society and technical committee news,
- conference and publication opportunities, new books, and Ph.D. theses,
- signal processing related research opportunities, and
- activities in industry consortiums, local chapters, and government programs.

The e-Newsletter is a gateway to reach out to signal processing professionals around the world. We invite you to contribute and share your news with tens of thousands of SPS members through this monthly electronic publication with fast turn-around cycle. IEEE members may manage their subscription of the email notification of the eNews and related SPS announcements at [this page](#). Please bookmark <<http://enews.ieee-spm.org>> for current and archived issues of eNews.

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## Submission Instructions - Contribution for the June '07 Issue Due May 20, 2007

Please contact the Associate Editors of the corresponding sections as listed below to provide your input or if you have questions. Make sure that you include your name, affiliation, and email and phone contact information. Contributions submitted by **May 20, 2007** will be considered for inclusion in the **next issue** of the SPM e-Newsletter.

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## Contact Information of the SPM e-Newsletter Team

Min Wu, *SPM Area Editor for e-Newsletter*, University of Maryland, College Park, USA (minwu AT umd.edu)

Huaiyu Dai, *Associate Editor*, North Carolina State University, Raleigh, USA (huaiyu\_dai AT ncsu.edu)  
*Conference and publication news*

Alessandro Piva, *Associate Editor*, University of Florence, Italy (piva AT lci.det.unifi.it)  
*News and activities in local chapters and research groups (including new Ph.D. theses)*

Mihaela van der Schaar, *Associate Editor*, University of California, Los Angeles, USA (mihaela AT ee.ucla.edu)  
*News and activities of SPS Technical Committees, industry consortiums and international standards*

Nitin Chandrachoodan, *Digital Production Editor*, Indian Institute of Technology – Madras (nitin AT ee.iitm.ac.in)  
*Online submission and production system*

Shih-Fu Chang, *SPM Editor-in-Chief*, Columbia University, New York, USA (sfchang AT ee.columbia.edu)

\* Please replace "AT" in the email addresses with @.

[Back to Top](#)

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## In-Depth Articles of May 2007 SPM eNews

### Special Report:

#### ICASSP 2007 Hawaii - Where Signal Processing Meets Aloha

Contributors: [ICASSP 2007 Organizing Committee](#)

The 32nd IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) was held in Honolulu, Hawaii, on April 15-20, 2007 [<http://www.icassp2007.org/>]. ICASSP is the world's largest and comprehensive technical conference focused on signal processing and its applications. This year is the first time in ICASSP's three decade history that it was held in Hawaii, the heart of the Pacific Rim. Over 1800 attendees from 42 countries came to Honolulu, Oahu, known traditionally as the "Gathering Place" in Hawaii, to attend ICASSP.

A total of 2912 papers were submitted to ICASSP 2007, out of which 1344 papers were accepted for presentation, including 72 papers in 12 special sessions. The conference offered a broad spectrum of choices for the attendees, including a number of world-class speakers, 72 lecture sessions, 96 poster sessions, 2 special panel discussions, 15 tutorials, 3 hands-on workshops, and 11 exhibitors.

The opening awards ceremony honored the winners of 2006 [major SPS awards](#) and newly elected 2007 [IEEE Fellows](#) who are SPS members. Winners and finalists of the Student Paper Award Contest were recognized in the ICASSP welcome reception. A total of 54 student finalists were nominated by various technical committees, and each finalist made a 10-minute oral presentation to one of three judging panels, followed by 5 minutes of questions and answers. One first prize, two second prizes, three third prizes, and four honorable mentions were chosen, based on quality of oral presentation (including technical competency and ability to answer questions), quality of technical contents, and significance of the results and potential impact.

The conference venue was the [Hawai'i Convention Center](#), which was ranked as North America's most attractive convention center and winner of numerous awards. Recognized as a "living work of art," the Center's design captures the essence of the Hawaiian environment. Its soaring, glass-front entry – with a 70 foot misting waterfall and mature palm trees – embraces guests with aloha. The facility houses a \$2 million Hawaiian art collection of unique pieces and features a rooftop tropical garden of native flora.

The coffee breaks and welcome reception featured a special Hawaiian touch and fusion of the East and the West. Throughout the conference, attendees enjoyed a broad selection of high-quality hors d'oeuvres, celebrated Kona coffee drinks, and exotic fruits and fresh juices.

The conference banquet was held at the historic Royal Hawaiian Hotel. The hotel, which is also known as the Pink Palace of the Pacific due to its distinctive color, is listed in the National Registry of Historic Places. It is one of the first hotels built in Waikiki, having opened in 1927, and served as the Western White House during Franklin D. Roosevelt's presidency. After receiving a lei greeting, the attendees enjoyed an hour-long cocktail reception, featuring arts and crafts demonstrations from seven Polynesian islands (Samoa, Aotearoa, Fiji, Hawaii, Marquesas, Tahiti, and Tonga). At the sound of the Conch Shell, the traditional luau banquet began at the ocean front lawn, serving a wide variety of foods including traditional Hawai'ian cuisine. Following the feast, the Polynesian Cultural Center provided dance and music performances, showcasing the unique culture and spirit of various Island Nations of Polynesia. The exciting fire knife dancers, followed by the beloved Island farewell song "Aloha Oe" written by Queen Liliuokalani, brought an unforgettable ending to the ICASSP Luau Night.



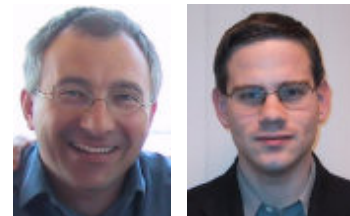
The ICASSP 2007 [Organizing Committee](#):

(from left to right) Todd Reed, General Co-Chair; Phil Chou, Special Session/Panel Chair; Hideaki Sakai, Tutorial Chair; Yih-Fang Huang, Technical Co-Chair; Zixiang Xiong, Publication Chair; Anthony Kuh, Technical Co-Chair; Min Wu, Finance Chair; K.J. Ray Liu, General Co-Chair; Billene Mercer, Registration and Conference Management; Kiyoharu Aizawa, Publicity Chair.

[Return to Conference News](#)

## Exclusive TC Report from Multimedia Signal Processing Technical Committee

Contributors: Ingemar Cox, MMSP Chair  
Anthony Vetro, MMSP Chair-elect



The IEEE Multimedia Signal Processing (MMSP) Technical Committee promotes the advancement of multimedia signal processing technology with special emphasis on the interaction, coordination, synchronization, and joint processing of multimodal signals. The MMSP-TC serves the technical membership of the IEEE Signal Processing Society in a number of ways, including organization of conferences and workshops, award nominations, and supporting related journals.

One of the most important activities of this TC is to organize the MMSP workshop, which has been held annually since 1997, except for 2003, and has enjoyed great success and reputation. This single track workshop provides an intimate forum for researchers and practitioners working in the field to present new ideas and interact with one another. Recent editions of the workshop have included overview talks in specific area of interest, in addition to high-quality keynotes and panel discussions featuring well known experts in the field. Typical acceptance rates for oral presentations in this workshop have been less than 20%. The next MMSP workshop will be held October 1-3, 2007 in Chania, Crete with the theme Multimedia Interaction and Communication. Please see <http://www.mmsp2007.org/> for further details on the technical and social program.

TC members are also actively involved in the paper reviews of ICASSP and ICME, and often assume leadership roles as part of the organizing committee for these larger conferences. The most related journals to the MMSP technical committee include the IEEE TRANSACTIONS ON MULTIMEDIA and IEEE TRANSACTIONS ON INFORMATION FORENSICS AND SECURITY.

Generally speaking, MMSP is a field that emphasizes applications. Many core research issues, such as video indexing, multimedia streaming, multimedia security, and multi-modal human computer interface, are motivated by real world applications. In addition, MMSP technical areas have been the main foci of international multimedia standards such as MPEG-7 and MPEG-21.

The MMSP-TC is currently composed of 30 elected members. For more details about the activities and events of interest related to this TC, please visit the TC website <http://mmsptc.adastral.ucl.ac.uk/>.

[Return to TC News](#)

## Standardization Efforts for Mobile TV Services

Contributor: Thomas Stockhammer (Nomor Research) and Mark Watson (Digital Fountain)

Mobile TV targets bringing TV-like services to mobile phones. However, mobile phones nowadays differ significantly from traditional TV equipments, for example, they integrate two-way communication network connections and flexible operating systems as well as powerful hardware platforms allowing smart software applications. This provides the possibility that mobile TV users can enjoy personalized and interactive TV with content specifically adapted to the mobile medium. In addition to traditional live TV channels, mobile TV delivers a variety of services including video-on-demand and Mobile TV pod casts, where content is delivered to a user's mobile on-demand or by subscriptions.

From a delivery perspective there are currently two different approaches of delivering mobile TV services. A point of note is that more than 90% of commercially deployed Mobile TV services nowadays run over two-way cellular network such as UMTS, CDMA2000, WiMAX, or extensions of those. However, more recently, unidirectional broadcast technologies such as DVB-H, DMB/DAB and MediaFLO are attracting significant attention. Furthermore, two-way cellular networks are currently being extended with IP multicast transport, e.g. with 3GPP MBMS or 3GPP2 BCMCS, which will provide the possibility to distribute IP multicast data over point-to-multipoint radio bearers, increasing efficiency and so delivering more services.

While first deployments provide good user experience, standardization bodies continue to work on improvements and extensions of existing solutions to provide richer services, better efficiency, increased coverage and improved scalability (support of many users in parallel).

Among others, the following bodies address the standardization of Mobile TV services:

- 3GPP introduced its Mobile Broadcast/Multicast Services (MBMS) in Release 6 which allows streaming video services as well as download/podcast services over IP multicast transport utilizing point-to-multipoint transmission on the UMTS (and also GSM) air interface. For reliability within the download and streaming services, MBMS makes use of advanced application layer packet forward error correction by applying Raptor codes. This approach significantly improves performance over fading mobile radio channels due to the effective time diversity of several seconds or minutes.
- In addition, recent advances in 3GPP's packet-switched streaming services allow faster channel switching, support of H.264/AVC, and other optimizations.
- In ongoing work, 3GPP is working on the extension of MBMS and Mobile TV services to advanced packet-switched transmission modes such as High-Speed Packet Access (HSPA) and Long-Term Evolution (LTE). Work on "Dynamic and Interactive Multimedia Scenes" (DIMS) will allow broader support of rich multimedia services and interactivity.
- 3GPP2 has taken similar actions and also introduces an IP multicast mode with appropriate services within the BroadCast/MultiCast Service (BCMCS).
- The DVB Project has recently completed specifications for IP Datacast (IPDC) over DVB-H, which includes protocols for streaming and download delivery similar to MBMS, again including forward error correction with Raptor codes, as well as Service Protection and Electronic Service Guide capabilities. The DVB Project is currently working on enhancements of the systems with respect to improved channel switching times. Other enhancements will be provided by DVB-SH (Satellite to Handhelds), which extends the coverage of DVB-H like services, especially in rural areas, by adding satellite reception.
- Inspired by the DVB-H success, ATSC has recently issued a call for technology for mobile TV services.

Many other standardization bodies and forums, such as MediaFLO, DAB/DMB, WiMAX, and OMA, have similar



work items on their roadmap. Despite first deployments of Mobile TV already provide promising quality, it is expected that the experience of these first deployments and recent and future advances in research will inspire new and improved systems with innovative service offerings. Whilst first deployments have focused on traditional TV "channels", attention is now also turning to more targeted services, such as "clipcasting", "TV podcasting" and on-demand content. Advances can be expected in many different areas of signal processing and communications, for example in media coding, content delivery protocols, application layer reliability, radio access technologies, digital rights managements and conditional access. Current standards represent only the beginning of the mobile broadcast story, with an exciting future to come.

[Return to Standardization News](#)

## Turning the Page on Digital Rights Management

Contributor: Ton Kalker (HP Lab, Palo Alto, CA)

Digital Rights Management (DRM) technologies have been, still are and, in all likelihood, will be a heavily debated topic among all parties in the content value chain, from creation, through aggregation and distribution, to consumption. These DRM technologies enable content owners (think movie studios and record labels) to control the way in which (mostly) professional content is being distributed and consumed. An additional claimed advantage of applying DRM technologies is, in content owner speak, the ability to create new business models, such as Napster-like subscription models. A good overview of the history and state-of-the-art of DRM can be found at [this link](#).

From an end-user point of view, DRM technologies have not wholeheartedly been embraced. An often heard argument states that DRM technologies restrict the fair use of content, i.e. the ability to enjoy content whenever, wherever and on whatever (sufficiently capable) platform. The fact that iTunes content is only playable on 5 PCs and that iTunes content will not play on non-Apple portables is, among others, put forward as evidence that DRM is evil.

However, we should realize that DRM *technology* is only in part to blame for the perceived bad user experience and that DRM technologies constitute only a small fraction of the tools used in the global War on Piracy (WoP). Other elements in the global WoP are anti-circumvention & copyright law and the security infrastructure in new main-stream operating systems. With respect to the former, prime examples are given by the [Digital Millennium Copyright Act \(DMCA\)](#), which considerably restricts the legal options for reverse-engineering of copy(right) protection technologies, and the proposed "[Digital Broadcast Television Redistribution Control](#)" provision that would strictly enforce copyright compliance rules on HDTV demodulators. With respect to the latter, we observe that the new Microsoft Vista operating system is built upon a secure kernel that provides for a secure path from media source to media sink. However, some argue that as a [consequence](#) of this security framework the overall system reliability may suffer.

The political and business aspects of the WoP are not appropriate to be addressed solely by us as a technical community. However, we may attempt to build better technical solutions that will allow for a better user experience. In particular, we may try to overcome the problems associated with the presence of a multiplicity of *incompatible* DRM systems, of which [Microsoft DRM](#), [iTunes FairPlay](#) and [OMA DRM 2.0](#) are just a few examples. More concretely, we may try to build technical solutions that will allow users to enjoy their content on any sufficiently capable platform, freeing the user from being locked into a single eco-system, and for example allowing them to enjoy purchased content as easily on an Apple platform as well as on a Microsoft platform. One of the most relevant efforts in this respect is provided by the [Coral Consortium](#).

The Coral Consortium is a large cross-industry group that aims to provide a standardized DRM-data exchange protocol that will enable collaborating services and devices to seamlessly move content and associated meta-data around in appropriately defined eco-systems. This protocol is being defined in such a way that it has minimal impact on existing DRM solutions, allowing easy adoption by any service provider willing to interoperate with others. At the same time, the Coral Consortium is also working on defining a business template for an interoperable eco-system centered around the concept of a provider-independent [authorized-domain](#). This template also provides guidelines for compliance and robustness rules, trust anchors and usage rules.

The hope is that Coral will turn the page on DRM and take away some of the user frustration associated with DRM technology, enabling an environment where end-users have more freedom in using content, where content owners will feel comfortable in that their assets are protected and where DRM providers will still be able to compete. If Coral or similar efforts such as the [Digital Media Project](#) fail, the future of digital content and content distribution will remain uncertain. DRM will not simply disappear, despite some signs to [the opposite](#). The call for interoperability is strong and will be hard to ignore.

[Return to Industry News](#)

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