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Highlights of This Issue

- [Society News](#): Kailath honored with the highest IEEE award - IEEE Medal of Honor
- [Call for Nominations](#): 2008 IEEE Medals and SPS Major Awards
- [Conference News](#): Statistical Signal Processing Workshop to be held in Madison, Wisconsin
- [Journal News](#): Check out special issue opportunities and new search engine SciTopia.org
- [TC News](#): Exclusive Report from the Image and Multidimensional Signal Processing TC
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1. Society News

Thomas Kailath - 2007 Recipient of the IEEE Medal of Honor

[Dr. Thomas Kailath](#), a respected leader in digital signal processing and systems theory, has been named the recipient of the [2007 IEEE Medal of Honor](#) for "exceptional development of powerful algorithms in the fields of communications, computing, control and signal processing." Some of Kailath's most recent research has influenced modern work in semiconductor manufacturing and wireless communications. Dr. Kailath, Professor Emeritus at Stanford University, will be presented with the award at the annual IEEE Honors Ceremony in June 2007.

[The May 2007 issue of the IEEE Spectrum](#) magazine featured Dr. Kailath on its cover and an in-depth interview.

The [IEEE Medal of Honor](#) is the highest IEEE award and is presented for an exceptional contribution or an extraordinary career in an IEEE field of interest. The award is sponsored by the IEEE Foundation. The award consists of a gold medal, bronze replica, certificate and honorarium.

Call for Nomination of 2008 IEEE Jack S. Kilby Signal Processing Medal

Nomination forms for the next year's IEEE Jack S. Kilby Signal Processing Medal are now available and due on **2 July 2007**. 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. Check [online](#) for more information.

Other IEEE medals, including the IEEE Medal of Honor, are also calling for nomination by **2 July 2007**. Check [online](#) for more information.

Nominations Open for 2007 Major SPS Awards

The SPS Awards Board is now accepting nominations for 2007 major SPS awards. Each year, SPS honors outstanding individuals who have made significant contributions related to signal processing. The deadline for the Society Award, the Technical Achievement Award, the Education Award, and the Meritorious Service Award is **October 1, 2007**. The Society also recognizes outstanding publications in SPS journals and magazines through Best Paper Awards, Young Author Best Paper Awards, and Signal Processing Magazine Best Paper Award. The deadline for the paper awards is **September 1, 2007**.

The award nominations, which are submitted to SPS Vice President - Awards and Membership, will be vetted by the appropriate [technical committees](#). Prospective nominators are encouraged to submit nominations well in advance of the deadlines. Detailed information and nomination forms of SPS awards can be found [online](#).

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2. Conference News

SSP 2007 Call for Participation

The IEEE Statistical Signal Processing (SSP) workshop, sponsored by the IEEE Signal Processing Society, brings members of the IEEE Signal Processing Society together with researchers from allied fields such as statistics and bioinformatics. [This year's workshop](#) will be held on August 26-29, 2007, in Madison, Wisconsin, a vibrant city situated on a narrow isthmus between two large lakes. Plenary lecturers include Emmanuel Candes, Richard Davidson, William Freeman, Nir Friedman, Jelena Kovacevic, and George Papanicolaou.

The scope of the workshop includes basic theory, methods and algorithms, and applications of statistics in signal processing. Topics to be covered include adaptive systems and signal processing; Monte Carlo methods; detection and estimation theory; learning theory and pattern recognition; multivariate statistical analysis; system identification and calibration; and time-frequency and time-scale analysis. Application areas of particular interest include bioinformatics and genomic signal processing; automotive and industrial applications; array processing, radar, and sonar; communication systems and networks; sensor networks; information forensics and security; biosignal processing and medical imaging; and new methods, directions, and applications. Registration is now open and the advanced registration deadline is July 1, 2007. Further information is available at <http://ssp07.org>.

SPS Conference Call-for-Paper & Deadlines	Location	Date	Tutorial/ Special Session	Submission Deadline
Picture Coding Symposium (PCS'07)	Lisbon, Portugal	Nov. 7-9, 2007		June 10, 2007
IEEE Automatic Speech Recognition and Understanding Workshop (ASRU'07)	Kyoto, Japan	Dec. 9-13, 2007	Sept. 24, 2007 (demo)	July 16, 2007
IEEE International Symposium on Signal Processing & Information Technology (ISSPIT'07)	Cairo, Egypt	Dec. 15-18, 2007	July 1, 2007	July 1, 2007
International Symposium on Communications, Control and Signal Processing (ISCCSP'08)	St. Julians, Malta	March 12-14, 2008		Oct. 1, 2007
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP'08)	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
IEEE International Workshop on Genomic Signal Processing and Statistics (GENSIPS'07)	Tuusula, Finland		June 10-12, 2007
IEEE Workshop on Signal Processing Advances in Wireless Communications (SPAWC'07)	Helsinki, Finland		June 17-20, 2007
IEEE International Conference on Multimedia & Expo (ICME'07)	Beijing, China		July 2-5, 2007
IEEE Workshop on Statistical Signal Processing (SSP'07)	Madison, WI	July 1, 2007	Aug. 26-30, 2007
IEEE International Workshop on Machine Learning for Signal Processing (MLSP'07)	Thessaloniki, Greece	July 2, 2007	Aug. 27-29, 2007
IEEE International Conference on Advanced Video and Signal based Surveillance (AVSS'07)	London, UK	July 19, 2007	Sep. 5-7, 2007
Biometrics Symposium (BYSM'07)	Baltimore, MD	TBA	Sep. 11-13, 2007
International Symposium ELMAR (ELMAR'07)	Zadar, Croatia	June 6, 2007	Sep. 12-14, 2007
IEEE International Conference on Image Processing (ICIP'07)	San Antonio, TX	August 1, 2007	Sep. 16-19, 2007

IEEE International Workshop on Multimedia Signal Processing (MMSP'07)	Chania, Crete	TBA	Oct. 1-3, 2007
IEEE Conference on Signal Processing Systems (SIPS'07)	Shanghai, China	July 31, 2007	Oct. 17-19, 2007
IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA'07)	New Paltz, NY	August 31, 2007	Oct. 21-24, 2007
Asilomar Conference on Signals, Systems, and Computers (Asilomar'07)	Pacific Grove, CA	TBA	Nov. 4-7, 2007
International Packet Video Workshop (PV'07)	Lausanne, Switzerland	TBA	Nov. 12-13, 2007
IEEE International Workshop on Computational Advances in Multi-channel Sensor Array Processing (CAMSAP'07)	U.S. Virgin Islands	TBA	Dec. 12-14, 2007

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3. Publication News

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

[SPM Columns/Forums](#) rolling submission deadlines

Special Issue on [Visual Cultural Heritage](#): white paper due **1 July 2007**

The application of signal processing to the analysis of visual Cultural Heritage artworks (man-made or natural) is still a very uncommon practice. Lately, however, there has been a greater interest on both sides for acquiring and processing Cultural Heritage-related image data in order to facilitate their storage, transmission, representation, analysis and fruition. Efforts in these areas have been supported with promising results demonstrated by some high visibility projects and by many initiatives worldwide. Digital signal processing serves as a foundation upon which many applications must rely for optimal results.

This special issue solicits tutorial articles with comprehensive surveys of important theories, algorithms, tools, and applications of signal processing to visual Cultural Heritage. Prospective authors should follow [these instruction online](#) to submit a white paper summarizing the motivation, the significance of the topic, a brief history, and an outline of the content.

Special Issue Deadlines of SPS Journals

- Special issue on "[New Approaches to Statistical Speech and Text Processing](#)" - Deadline: **15 June 2007**. (Transactions on Audio, Speech, and Language Processing)
- "[MIMO-Optimized Transmission Systems for Delivering Data and Rich Content](#)" - Deadline: **15 July 2007**. (Journal of Selected Topics in Signal Processing)
- Special issue on "[Multimedia Applications in Mobile/Wireless Context](#)" - Deadline: 31 July 2007. (Transactions on Multimedia)
- "[Genomic and Proteomic Signal Processing](#)" - Deadline: 1 September 2007. (Journal of Selected Topics in Signal Processing)
- "[Distributed Processing in Vision Networks](#)" - Deadline: 15 October 2007. (Journal of Selected Topics in Signal Processing)

Journal of Selected Topics in Signal Processing (JSTSP) - Call for Proposals of Special Issues:

J-STSP is a new journal of the IEEE Signal Processing Society that emphasizes emerging technical areas within the discipline. For information on submitting papers to these special issues, or how to propose a topic for the journal, please visit the [J-STSP website](#). Inquiries can be addressed to Prof. A. Lee Swindlehurst, *Editor-in-Chief* (Brigham Young University, UT, USA), Email: [swindle AT ee.byu.edu].

SCITOPIA.ORG Research Site Set to Launch in June

IEEE and 12 of the world's leading science and technology societies are launching scitopia.org, a free federated search engine that will enable users to explore research most often cited in scholarly work and patents. More than three million documents, including peer-reviewed journal content and conference proceedings spanning 150 years of science and technology, may be searched through this dedicated gateway.

Search results will present users with a relevant, ranked list of content that will include the article's title, authors and citation. Once a piece of content is selected, the user will be directed to the publisher's digital library site to access the full text. Researchers at institutions with subscriptions to the content will be automatically authenticated and will be able to click through to access the full text. For full details about the service and a full list of participating societies, visit <http://www.scitopia.org>.

Recent Issues of SPS Sponsored and Co-sponsored Publications

Journal Title	Latest Issue available online	Cover & Contents	Xplore Link
IEEE Signal Processing Magazine <ul style="list-style-type: none"> • Special Issue on Resource-Constrained Signal Processing, Communications, and Networking • DSP History: Interview with Dr. Lotfi Zadeh on Fuzzy Logic • Columns on Processing on GPUs and DSP Software Optimization 	vol. 24, no. 3	PDF	Html
IEEE Transactions on Audio, Speech, and Language Processing	vol. 15, no. 4	PDF	Html
IEEE Transactions on Image Processing	vol. 16, no. 6	PDF (in color)	Html
IEEE Transactions on Information Forensics and Security	vol. 2, no. 2	PDF	Html
IEEE Transactions on Signal Processing	vol. 55, no. 6	Part 1 Part 2	Html
IEEE Signal Processing Letters	vol. 14, no. 6	PDF	Html
Journal Title	Latest Issue available online	Cover/ Contents (in PDF)	Xplore Link
IEEE Transactions on Medical Imaging	vol. 26, no. 6	PDF	Html
IEEE Transactions on Mobile Computing	vol. 6, no. 7	PDF	Html
IEEE Transactions on Multimedia	vol. 9, no. 4	PDF	Html
IEEE Sensors Journal	vol. 7, no. 7		Html
IEEE Transactions on Wireless Communications	vol. 6, no. 5	PDF	Html
Computing in Science & Engineering Magazine	vol. 9, no. 3		Html
IEEE MultiMedia	vol. 14, no. 2	PDF	Html

4. TC News

Image and MultiDimensional Signal Processing (IMDSP) Technical Committee

The IEEE Image and MultiDimensional Signal Processing (IMDSP) Technical Committee promotes the advancement of the field of image and video and multidimensional signal processing. One of the TC's most important responsibilities is overseeing the organization and the technical program and serving as core reviewers for the IEEE International Conference on Image Processing (ICIP), which is the largest and premiere IEEE conference on image and video. The IMDSP TC also coordinates the paper reviews for ICASSP in the IMDSP area, organizes and operates workshops related to IMDSP, makes nominations for Society awards and paper awards, assists in the selection of SPS Distinguished Lecturers, assists in the development of IEEE standards, and supports various IEEE publications in the area of IMDSP. Learn more about the IMDSP TC effort through this [exclusive in-depth report](#).

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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
Eastern North Carolina	11-Jun-2007	Robert Gray: "Packet speech on the Arpanet: A history of early linear predictive coded (LPC) speech and its accidental impact on the Internet Protocol," 6:30pm, NC IDEA Campus Auditorium Building 1 (formerly MCNC Auditorium; see directions). Contact: H. Joel Trussell [hjt AT ncsu.edu].
Greece	5-14 June, 2007	Georgios Giannakis: "Distributed Estimation Using Wireless Sensor Nets" (5-Jun-2007) and "Wireless Cooperative Communications" (14-Jun-2007) Contact: [thanos AT ee.upatras.gr]
Turkey	7-12 June, 2007	At METU Informatics Institute, Ankara (contact: yardimy AT ii.metu.edu.tr) <ul style="list-style-type: none"> · Georgios 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) <ul style="list-style-type: none"> · Georgios Giannakis: "Wireless Cooperative Communications" (11-Jun-2007) · Luis Torres: "Distributed Video Coding" (12-Jun-2007)
Dallas, TX	17-Sep-2007	Georgios Giannakis: "Distributed Estimation Using Wireless Sensor Networks," 11am, at TI Auditorium, ECS Building South, University of Texas at Dallas. See event details .
Colombia	27-Sep-2007	Aggelos Katsaggelos: "Image and Video Recovery," invited DL talk at 12th Symposium on Signal Processing, Image Processing and Machine Vision (XII STSIVA), 9am. See event details . Contact: [xii_stsiva AT uninorte.edu.co]
Chapter	Dates	Other Upcoming Events
Northern Virginia	14-Jun-2007	Bruce Flinchbaugh (Texas Instruments): "Smart Camera Systems Technology Roadmap." See event details . RSVP encouraged to Tim Settle [settlet@saic.com].

**United Kingdom
& Republic of
Ireland**

25-27 July,
2007

Co-sponsoring Visual Information Engineering 2007 Conference, to be held at the Royal Statistical Society, London, UK. Visit the [UKRI chapter website](#) and the [conference website](#) for more information.

If you are interested in organizing a new SPS chapter, or participating in 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](#).

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6. Standard/Industry News

Standardization Effort on Cognitive Radio for Dynamic Spectrum Access

Dynamic spectrum access provides a suite of spectrum management policies and techniques envisioned to resolve the paradox between the overly crowded spectrum and pervasive idle frequency bands revealed by actual spectrum usage measurements. Such techniques have recently captured much attention. Standardization activities regarding dynamic spectrum access have also taken place. The IEEE P1900 Standards Group was established in 2005, aiming to develop supporting standards dealing with new technologies and techniques being developed for cognitive radio and dynamic spectrum access. In March, the IEEE Standards Board approved the reorganization of the IEEE 1900 effort as Standards Coordinating Committee 41 (SCC 41), Dynamic Spectrum Access Networks (DySPAN). Learn more about the standardization effort of cognitive radio from the [in-depth report](#).

Peer-to-Peer System and Applications

Development of peer-to-peer (P2P) systems and applications may radically change the way that the Internet is used today. A unique characteristic of the P2P application is that the peers bring with them serving capacity when they join the network. Therefore, as more peers join the system and the demand of a peer-to-peer system grows, the capacity of the system grows too. This is in sharp contrast to the traditional client-server system, where the server capacity is fixed and paid for by the provider. Learn more about the on-going industrial R&D on P2P from the [in-depth article](#).

Learn [Standards in a Nutshell](#) from the latest issue of SPM on "W3C Speech Interface Languages: VoiceXML" by James A. Larson ([May 2007, pp. 126-130](#)).

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7. New PhD Theses

Svetlana Monakhova Bachmann (University of Oklahoma):
"Spectral Analyses of the Dual Polarization Doppler Weather Radar Data," March 2007.
Advised by Prof. Tian-You Yu.

The national network of weather radars is undergoing an upgrade to include the dual polarization capability. The time series obtained with the polarimetric prototype of the forthcoming weather radar are used to study echoes in clear air. Clear air echoes have low signal to noise ratios that create a challenge for signal processing techniques. Clear air echoes contaminated by bird returns during migration are usually considered to be worthless for meteorological interpretation. This dissertation presents novel polarimetric

spectral analyses that help distinguishing signatures of different types of scatterers present in the same resolution volumes. Spectral techniques for data censoring, wind retrieval, and estimation of intrinsic values/functions of polarimetric variables for different types of scatterers are presented. The possibilities of spectral processing using parametric estimation techniques are explored for resolving contributions to the Doppler spectrum from the three types of scatterers: passive wind tracers, actively flying insects, and birds. A combination of parametric and non-parametric polarimetric spectral analyses is used to estimate the small bias introduced to the wind velocity by actively flying insects.

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

Patrick Vandewalle (Ecole Polytechnique Fédérale de Lausanne - EPFL, Switzerland):
"Super-Resolution from Unregistered Aliased Images," July 2006.
 Advised by Prof. Martin Vetterli and Prof. Sabine Süsstrunk.

Aliasing in images is often considered a nuisance. However, aliasing can also convey useful information about the high frequency content of the image, which is exploited in super-resolution applications. We use a set of aliased input images of the same scene to extract such high frequency information and create a higher resolution, aliasing-free image. In general, super-resolution image reconstruction can be formulated as a multichannel sampling problem with unknown offsets. This results in a set of equations that are linear in the unknown signal coefficients but nonlinear in the offsets. This thesis concentrates on the computation of these offsets, as they are an essential prerequisite for a high resolution reconstruction. First, a super-resolution method for partially aliased signals is presented. Then, three methods for totally aliased signals are described: two of them use a subspace approach, while the third uses Gröbner bases. These algorithms are tested in simulations and practical experiments.

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

Ian Chan Wong (University of Texas at Austin):
"A Unified Framework for Optimal Resource Allocation in Multiuser Multicarrier Wireless Systems," April 2007.
 Advised by Prof. Brian L. Evans.

The problem of allocating time slots, subcarriers, rates, and power to the different users in an OFDMA system has been an area of active research in recent years. Previous research efforts in OFDMA resource allocation have typically focused on maximizing instantaneous performance, developing sub-optimal heuristic algorithms, and assuming perfect channel state information (CSI) is available at the transmitter. This dissertation focuses on developing a unified algorithmic framework based on dual optimization techniques that have complexities that are linear in the number of subcarriers and users, and that achieve negligible optimality gaps in standards-based numerical simulations. This framework is applicable to continuous/ergodic instantaneous/discrete rate maximization, and assuming perfect/imperfect CSI with or without channel distribution information.

[Click here](#) to download the dissertation, or contact the author at <ian.wong AT ieee.org>.

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 officially been submitted according to the Ph.D. degree requirements of the author's institution.

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8. New Books

Blind Image Deconvolution: Theory and Applications, by P. Campisi and K. Egiazarian (editors), CRC, 2007.

[Book Description From the Publisher](#): Blind image deconvolution is constantly receiving increasing attention from the academic as well the industrial world due to both its theoretical and practical implications. The field of blind image deconvolution has several applications in different areas such as image restoration, microscopy, medical imaging, biological imaging, remote sensing, astronomy, nondestructive testing, geophysical prospecting, and many others. *Blind Image Deconvolution: Theory and Applications* surveys the current state of research and practice as presented by the most recognized experts in the field, thus filling a gap in the available literature on blind image deconvolution.

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

VLSI DESIGN OF WAVELET TRANSFORM -Analysis, Architecture, and Design Examples, by Liang-Gee Chen, Chao-Tsung Huang, Ching-Yeh Chen and Chih-Chi Cheng, World Scientific, 2006.

[Book Description From the Publisher](#): Discrete wavelet transforms (DWTs) have led the revolutions in image and video coding systems over the past decade. In this book, the DWT is presented from the VLSI design perspective, and the related theories, algorithms, and architectures are discussed for 1D, 2D, and 3D DWT. The book provides a comprehensive analysis and discussion of DWTs and their applications including important materials and the newest developments in wavelet processing. For example, the architecture designs of 2D DWT in JPEG 2000 and the development of motion-compensated temporal filtering (MCTF) are explored.

[Contents] 1. Introduction; 2. Algorithm Views of Discrete Wavelet Transform; 3. Architectures of One-Dimensional DWT; 4. Architectures of Two-Dimensional DWT; 5. Practical Design Examples of 2-D DWT: JPEG 2000 Encoder Systems; 6. Introduction to MCTF; 7. Introduction to Motion Estimation; 8. Analysis and Architecture of MCTF.

Multirate Statistical Signal Processing, by O.S. Jahromi, Springer, April 2007

Book Description: This book introduces a unified statistical theory for the analysis and design of multirate signal processing systems. This new theory generalizes the deterministic theory of multirate systems beyond many of its constraints. Furthermore, it allows for the formulation and solution of several new problems including multirate spectrum estimation, multirate time-delay estimation and multirate sensor fusion.

More information can be found at [the author's website](#) and the [publisher's website](#).

Local Approximation Techniques in Signal and Image Processing, by V. Katkovnik, K. Egiazarian, and J. Astola, SPIE Press, September 2006.

[Book Description From the Publisher](#): This book deals with a wide class of novel and efficient adaptive signal processing techniques developed to restore signals from noisy and degraded observations. These signals include those acquired from still or video cameras, electron microscopes, radar, X rays, or ultrasound devices, and are used for various purposes, including entertainment, medical, business, industrial, military, civil, security, and scientific applications.

[Contents] Preface; Notations and Abbreviations; 1 Introduction; 2 Discrete LPA; 3 Shift-Invariant LPA Kernels; 4 Integral LPA; 5 Discrete LPA Accuracy; 6 Adaptive-Scale Selection; 7 Anisotropic LPA; 8 Anisotropic LPA-ICI Algorithms; 9 Image Reconstruction; 10 Nonlinear Methods; 11 Likelihood and Quasi-Likelihood; 12 Photon Imaging; 13 Multiresolution Analysis; 14 Appendix; References; Index.

Embedded Image Processing on TMS320C6000 DSP:

Examples in Code Composer Studio and Matlab, by 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 SPM May 2007 issue.

New Books Featured in Previous Issues [\[details\]](#)

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.

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

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9. Research Opportunities

2-year Post-doc Position on Wireless Biomedical Sensor Network

Institution: National Hospital of Norway in Oslo and Norwegian University of Science and Technology (NTNU) in Trondheim

Application Deadline: 1 September 2007.

Research Project: Collaborative context aware signal processing

Several clinical applications require a combination of multiple biomedical sensors measuring some physiological parameters. The location of sensor nodes and the environment are often defined. Context awareness may provide information to maximize overall utility of the sensor network. The goal of the project is to develop more basic understanding of, and novel and more efficient principles/methods for signal processing and communications in wireless biomedical sensor networks. The project will mainly address basic research for improved energy-efficiency, quality-of-service (QoS), and robustness. For more information, please visit [<http://www.ivs.no/sampos>].

The candidate should have a Ph.D. degree or similar education trainings, and have a solid background in signal processing and wireless communications. It is also desirable that the candidate has knowledge in software development using C/MATLAB. The salary and terms are in accordance with Norwegian state regulations. Salary: NOK 380 000 – 430 000, (approximately US \$ 61 400 – 69 500).

For further information on the position, contact Prof. Ilanko Balasingham [ilangkob AT klinmed.uio.no].

Research Opportunities Featured in Previous Issues [\[details\]](#)

- Vice Chancellor's Strategic Research PhD Scholarship at Victoria University of Wellington, New Zealand
- Post-doc positions in Network Science at Army Research Laboratory (ARL), Adelphi, MD, USA

Job Posting Portals

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

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

http://engineering.academickeys.com/seeker_job.php

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Contributors of articles in this issue:

John Apostolopoulos, Sheila Hemami, Jin Li, Rebecca Willett, and Qing Zhao.

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.

Submission Instructions - Contribution for the July '07 Issue Due June 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 **June 20, 2007** will be considered for inclusion in the **next issue** of the SPM e-Newsletter.

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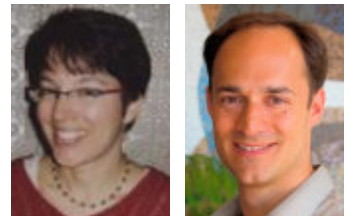
* Please replace "AT" in the email addresses with @.

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In-Depth Articles of June 2007 SPM eNews

Exclusive Report from Image and MultiDimensional Signal Processing Technical Committee

Contributors: Sheila Hemami (Cornell University), TC Chair
John Apostolopoulos (HP Labs), Vice chair



The purpose of the IEEE Image and MultiDimensional Signal Processing (IMDSP) Technical Committee is to promote and guide the advancement of the field of image and video and multidimensional signal processing. This includes those areas listed under all [EDICS categories of the IEEE Transactions on Image Processing](#) and under the [EDICS subcategory Multidimensional Signal Processing](#) of the IEEE Transactions on Signal Processing.

The IMDSP TC's responsibilities include assisting in reviewing submissions to the Signal Processing Society (SPS) conferences. For example, the TC coordinates the paper reviews for ICASSP in the IMDSP area and also serves as core reviewers in this area (460 papers were submitted in the IMDSP area in the recent ICASSP'07). The TC also organizes and operates independent workshops, makes nominations for Society awards and paper awards, assists in the selection of SPS Distinguished Lecturers, assists in the development of IEEE standards, and supports various IEEE publications in the area of IMDSP including IEEE Transactions on Image Processing, IEEE Transactions on Signal Processing, and IEEE Signal Processing Letters. TC members also support a variety of [other related conferences and workshops](#), often assuming leadership roles as part of the organizing committee.

One of the TC's most important responsibilities is overseeing the organization and the technical program, and serving as core reviewers, for the IEEE International Conference on Image Processing (ICIP), which is the largest and premiere IEEE conference on image and video. Topic areas include image/video coding and transmission; image/video processing; image formation for biomedical imaging and remote sensing; image

scanning, display, and printing; image/video storage, retrieval, and authentication; and applications in biomedical sciences, geosciences and remote sensing, document image processing and analysis, and other imaging applications. ICIP is held yearly and [ICIP 2007](#) will be held on September 16-19, 2007, in San Antonio, Texas, USA.

The IMDSP TC is composed of 30 elected members, plus the Chair, Vice Chair, Past Chair, and the Editor-in-Chief of the IEEE Transactions on Image Processing who is a nonvoting Ex Officio member. For more details about the activities of this TC please visit the [TC website](#).

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Standardization News: Cognitive Radio for Dynamic Spectrum Access



Contributor: Qing Zhao (University of California, Davis)

Cognitive radio has captured much attention recently. First promoted by Mitola in 1999, cognitive radio is a context-aware intelligent radio potentially capable of autonomous reconfiguration by learning from and adapting to the communication environment.

While cognitive radio represents a much broader paradigm where many aspects of communication systems can be improved via cognition, dynamic spectrum access is no doubt one of its most important applications.

Dynamic spectrum access is a suite of spectrum management policies and techniques envisioned to resolve the paradox between the overly crowded spectrum and pervasive idle frequency bands revealed by actual spectrum usage measurements. Approaches to dynamic spectrum access can be broadly categorized under three models, as detailed in [a recent survey](#) in the May issue of IEEE Signal Processing Magazine.

The dynamic exclusive use model maintains the basic structure of the current spectrum regulation policy: spectrum bands are licensed to services for exclusive use. The main idea is to introduce flexibility for improved spectrum efficiency. Two approaches have been proposed under this model: spectrum property rights and dynamic spectrum allocation. The former approach allows licensees to sell and trade spectrum and to freely choose technology. Economy and market will thus play a more important role in driving toward the most profitable use of spectrum. The latter was brought forth by the European DRIVE project. It aims to improve spectrum efficiency through dynamic spectrum assignment by exploiting the spatial and temporal traffic statistics of different services.

The opening sharing model (or the commons model) employs open sharing among peer users as the basis for managing a spectral region. Advocates of this model draw support from the phenomenal success of wireless services operating in the unlicensed ISM band (e.g., WiFi).

The third is the hierarchical access model. The basic idea is to open licensed spectrum to secondary users while limiting the interference perceived by primary users (licensees). Two approaches to spectrum sharing between primary and secondary users have been considered: spectrum underlay and spectrum overlay. The underlay approach imposes severe constraints on the transmission power of secondary users so that they operate below the noise floor of primary users. By spreading transmitted signals over a wide frequency band (UWB), secondary users can potentially achieve short-range high data rate with extremely low transmission power. Spectrum overlay was first envisioned by Mitola in 1999 and then investigated by the DARPA XG program (under the term "opportunistic spectrum access"). This approach directly targets at idle frequency bands in both time and space by allowing secondary users to identify and exploit instantaneous and local spectrum availability in a nonintrusive manner.

Standardization activities regarding dynamic spectrum access have also taken place. The IEEE P1900 Standards Group was established in 2005, aiming to develop supporting standards dealing with new technologies and techniques being developed for cognitive radio and dynamic spectrum access. In March, the

IEEE Standards Board approved the reorganization of the IEEE 1900 effort as Standards Coordinating Committee 41 (SCC 41), Dynamic Spectrum Access Networks (DySPAN). More details on SCC41 can be found at [<http://www.scc41.org/>].

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Industry News on Peer-to-Peer System and Applications



Contributor: Jin Li (Microsoft Research, Redmond, WA)

The peer-to-peer (P2P) system and applications may radically change the way that the Internet is used today. A unique characteristic of the P2P application is that the peers bring with them serving capacity when they join the network. Therefore, as more peers join the system and the demand of a peer-to-peer system grows, the capacity of the system grows, too. This is in sharp contrast to the traditional client-server system, where the server capacity is fixed and paid for by the provider. As a result, the P2P application is cheap to build and superb in scalability. It drastically reduces the operation cost of the server and offers better experience to the end users.

Currently, there is a growing interest in delivering video over the Internet. The traffic on the Internet is doubling each year, while the capacity of the Internet, grows at a far slower pace. A P2P system that considers the delivery locality and cooperates with existing infrastructure of servers and content delivery networks (CDNs) is the only viable technology to delivery huge amount of content efficiently, reliably and cost effectively to a huge user base.

The Communication and Collaboration Systems group at Microsoft Research researches best methods, protocols and systems in building P2P applications. One unique aspect of Microsoft's P2P research is that the existing Internet infrastructure (server, CDN nodes, Internet routing) is taken into consideration in designing a P2P system. The resulting solution is a hybrid of the P2P network and the existing server/CDN infrastructure. The approach has made the system friendly to the existing Internet service provider and infrastructure, and thus improve the scalability of the system.

The P2P research area at Microsoft covers the use of P2P network for asynchronous content distribution (file sharing), synchronous content distribution (gaming, conferencing, Internet TV), on-demand streaming, file backup and information retrieval, economics, markets and security issue. The focus is the communication and media processing technology that can be used to make efficient utilization of the peer resource, ensure reliable delivery of content, and support quality-of-service of the delivery in P2P network.

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