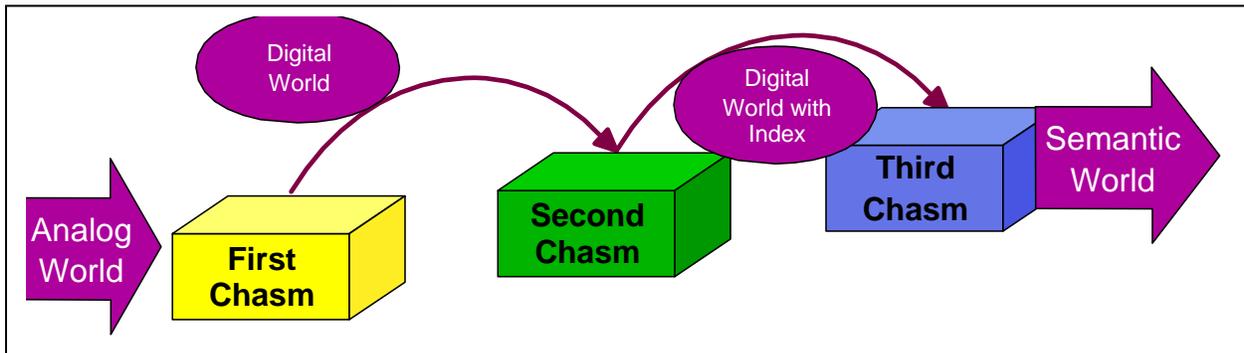


Multimedia Systems and Applications Technical Committee MSA TC 2000-2001 Committee Activities

Prepared by Dr. Chung-Sheng Li, Chair

Vision: Crossing the Chasms



The advances of multimedia technologies are strongly influenced by the necessity of the research and industry environment. It is possible to capture the evolution of the multimedia technologies by the following three phases:

- **First chasm:** The major advances during this stage are mostly driven by the need to capture the analog world in digital form. As a result, the major accomplishments include various coding and compression schemes, such as **JPEG, MPEG-1, MPEG-2, H.263, H.323, JPEG2000, and MPEG-4**. The main concern for compressing audio and image is lossy vs. lossless, and the amount of compression vs. signal-to-noise ratio for lossy compression. Motion compensation becomes one of the major concerns as we moved into video compression. Most of the initial implementations of various image and video codec have to be ASIC. The recent advances in DSP and general-purpose microprocessors have made it possible to conduct compression/decompression entirely in the software arena.
- **Second chasm:** As the amount of digital data such as images and video begin to accumulate, search and retrieval become one of the major challenges. As a result, the focus of crossing the second chasm is about how to create efficient and concise representation/indices of the digitized data to facilitate search and retrieval. These indices include low-level features (such as texture, color histogram for images) and high-level semantics. **MPEG-7** and a few other standards try to create interoperable definitions of these features and indices.
- **Third chasm:** There is still a tremendous gap between the low-level features extracted from the signals (audio, images, and video) and actionable “knowledge”. Only through knowledge models can we fuse data and information from multiple sources in multiple modalities. And there is no doubt that that the current and future efforts in the multimedia research are to provide intelligent extraction, annotation, and synthesis of models from data and information. These models can then be used to simulate predictions and generate corresponding actions. Once the semantic gap between information and data is removed, it is also more feasible to trade information, concepts, and media data in an information or media marketplace.

State of the Union

Research on multimedia systems and applications has advanced rapidly during the last decade. Its impacts have been highly visible in our daily lives. The major catalysts for the rapid advances include:

- Internet, which enable wide varieties of multimedia content to be available for browsing and downloading by anyone who has access to Internet.
- Semiconductor technologies, which enables virtually everyone to have affordable mechanisms to access the multimedia technologies

As a result, virtually every PC, laptop, and even the latest PocketPC (based on WinCE 3.0) come with a multimedia subsystem and has many multimedia capabilities. Consumer electronics multimedia systems such as DVD players (with MPEG2 decoder inside) have finally taken off and are currently penetrating our homes at an extreme speed. Multimedia applications such as digital libraries, distance learning, video conferencing, and universal multimedia access for pervasive devices have either taken place or are rapidly emerging.

These systems and applications have been very inter-disciplinary, and the IEEE Circuit and System Society has played an essential role in fostering the progress of these discipline.

The Multimedia Systems and Applications Technical Committee (MSATC) plays three important roles within the IEEE Circuits and Systems Society: (1) Champion those research areas which enable multimedia technologies (2) Champion those research areas which bring multimedia technologies into systems and applications (3) Introduce multimedia concepts, methods, and product into CAS operations.

The MSATC currently comprise 30+ members. The MSATC has been very actively participating in various technical activities of the CAS society: conferences, short courses, committee, publications, etc.

Scope of Multimedia

Prof. **Tsu-Han Chen**, member of this TC, has completed the revision of EDICS (see attachment A). The purpose of this EDICS is to provide a uniform classification of the papers submitted to Transactions on Multimedia and International Conference on Multimedia and Expo and the reviewers who are capable of reviewing these papers. The EDICS provides comprehensive scoping rules for the area of multimedia research. A total of eight major areas were identified:

- Signal processing for media integration
- Components and technologies for multimedia systems
- Human-machine interface and interaction
- Multimedia databases and file systems
- Multimedia communication and networking
- System integration

- Applications
- Standards

Charter of the Technical Committee

The draft charter (see attachment B) for MSATC is currently being refined by the technical committee, and will be formally adopted before the May 7, 2001 TC meeting in Sydney.

Technical Committee Meeting

Two TC meetings have been held during 2000 – one in May during ISCAS 2000 in Geneva (see attachment C for meeting minutes), and one in August during ICME 2000 in New York (see attachment D for meeting minutes). Both of the meetings were very well attended.

Awards and Recognitions

A number of TC members received awards and recognition during 2000-2001 time frame.

- Dr. **Bing Sheu** assumed the president of the Circuit and System Society during 2000.
- Five of our TC members, Prof. **Liang-Gee Chen**, Prof. **Jeng-Neng Hwang**, Dr. **Mohammed Ghanbari**, Dr. **Huifang Sun**, and Dr. **Sethurama Panchanathan** have been elected to the **class of 2000 IEEE Fellows**.
- The other TC member, Prof. **Shih-Fu Chang**, has received one of the best paper awards during ISCAS 2000 for his paper “A Fully Automated Content Based Video Search Engine Supporting Spatio-Temporal Queries” for *IEEE Transactions on Circuits and Systems for Video Technology*.
- Profs. **Ming-Ting Sun**, **Yih-Fang Huang**, and **Chung-Yu Wu** are currently in the 2000-2001 “*Distinguished Lectured Program*” of the IEEE Circuits and Systems Society.
- Profs. **Liang-Gee Chen** and **Shih-Fu Chang** have been selected by the DLP committee (chaired by Dr. Ellen Yoffa) to contribute to the 2001-2002 “*Distinguished Lectured Program*” of the IEEE Circuits and Systems Society.

Publications

In the publication activities, this TC has played a significant role in initiating the new IEEE Transaction on Multimedia (TMM). Currently, Prof. **Ming-Ting Sun**, also a member of this TC, is serving as the Editor-in-Chief, with many other members serving as the Associate Editor. Prof. **Yih-Fang Huang** and Dr. **Chung-Sheng Li** are serving as the CAS representatives to the Steering Committee of T-MM.

Our TC members also help in encouraging multimedia paper submission, reviewing, and serving editorial board for T-CSVT, T-VLSI, T-CAS Part I/II.

Conferences

In the conference activities, the MSATC has actively participated in organizing tutorial and special sessions for ISCAS 98, ISCAS 99, ISCAS 2000, and ISCAS 2001.

- Prof. **Ming-Ting Sun** served as the multimedia track chairs for ISCAS 2000 in Geneva.
- Dr. **Chung-Sheng Li** is serving as the multimedia track chair for ISCAS2001 in Sydney.
- During ISCAS 2000, Dr. **Jie Chen** organized a special session “Multimedia over Network”. This special session has attracted one of the best attendances during ISCAS.
- Dr. **Tom Sikora** contributed a tutorial session on MPEG-4 visual, which has also been very well received.
- During ISCAS 2000, Dr. **Sankar Basu** co-organized with colleagues from Katholieke University, Leuven, Belgium a special session on statistical learning. This session has also been very well received.
- During ISCAS 2001, Dr. **Jie Chen** contributes to a half-day tutorial session on “Understanding Emerging and Future Communication Technologies,” while Dr. **Chung-Sheng Li** contributes two sessions within the full-day tutorial session “Third-Generation Multiservice Wireless Network Architecture”, organized by Prof. Jamil Khan.

Since ISCAS 2000 was co-located with the MPEG meeting, an “MPEG-4 workshop and exhibition” is organized by one of the TC member, Prof. **Ming L. Liou**, in conjunction with Leonardo Chiariglione and Rob Koenen during ISCAS 2000, Geneva. The program chair, Dr. **Weiping Li**, also came from this TC. A very comprehensive tutorial and discussion have been given on the visual, audio, and system aspects of MPEG-4. This workshop was very well attended and received. The report from Prof. **Ming L. Liou** is below:

“The first Workshop and Exhibition on MPEG-4 was held in Geneva in conjunction with ISCAS 2000. The Workshop/Exhibition was sponsored by the CAS Society in cooperation with the MPEG-4 Industry Forum. Numerous MSATC members have contributed to the great success of this event. To continue tracking MPEG-4 deployment in various markets, and to further energize the development of MPEG-4 products, the second Workshop and Exhibition on MPEG-4 will be held from June 18-20, 2001, in San Jose, California.”

Starting from 1999, MSATC has also helped to co-founded a new conference – International Conference on Multimedia and Expo (ICME) jointly with three other sister societies that also have multimedia TC – Computer Society, Signal Processing Society, and Communication Society. This new conference is the premiere multimedia conferences within the IEEE, replacing the original ICMCS (International Conference on Multimedia Computing and Systems). The first conference has been held in New York during July/Aug of 2000, and was attended by 700+ people and has been a wildly successful event.

- Dr. **Sankar Basu**, a member of this TC, was the general chair of ICME 2000. Prof. **Tsuhuan Chen** and Dr. **Chung-Sheng Li**, both from this TC, were two of the four technical program co-chairs.
- Prof. **Peter Pirsh**, a member of this TC, has contributed a half-day tutorial “*Multimedia Processors: VLSI Architectures and Programming*”.

- Dr. **Bing Sheu** (founding chair of this TC), Prof. **Yi-Fang Huang**, and Dr. **Chung-Sheng Li** served on the steering committee between 1999-2000.
- Dr. **Chung-Sheng Li** was elected to chair the steering committee since the beginning of 2000.
- Currently, Profs. **Ming-Ting Sun**, **Liang-Gee Chen**, and **Yih-Fang Huang** are CAS representatives within the steering committee of ICME during 2001.
- Prof. **Ming-Ting Sun**, member of this TC, is one of the Technical Program co-chair of ICME 2001.

In addition, the MSATC also participated and/or co-sponsored many other conferences and workshops within or outside of the CAS society, including:

- International IEEE Conference on Electronics, Circuits, and Systems (ICECS) 2001 – Lebanon, 17-20, Dec. 2000.
- International IEEE Conference on Electronics, Circuits, and Systems (ICECS) 2001 – Malta, Sept. 2-5, 2001.
- Workshop on Signal Processing Systems (SiPS) 2000 – Lafayette, Louisiana, Oct. 11-13, 2000.
- Workshop on Signal Processing Systems (SiPS) 2001 - Belgium, Sept. 26-28, 2001

Activities Plan

The activity plan for the coming year is as follow:

1. Provides the vision and strategy for developing the interests in multimedia systems and applications within the IEEE Circuits and Systems Society.
2. Actively participate in TC duties, encouraging paper submissions, and organizing special sessions and tutorials for ISCAS 2001 as well as other related conferences and workshop
3. Strongly support Transaction on Multimedia in encouraging library subscription, promotion, end encouraging multimedia paper submission
4. Strongly support ICME2001 and future ICME's through encouraging paper submissions and organizing special sessions and tutorials
5. Recommending qualified persons to TMM, TCAS Part I and II, T-VLSI, and T-CSVT
6. Actively participate ACE courses
7. Recommend outstanding persons to CAS DLP
8. Pursue joint effort with other TCs to initiate inter-disciplinary research, education, and other technical activities
9. Explore and introduce new concepts and methods into various technical operations

Multimedia Systems and Applications Technical Committee 2001 Officer Report

Officers

Chair: Dr. Chung-Sheng Li

Term: 01/2000 – 12/2001

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Secretary: Prof. Liang-Gee Chen

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Attachment A.
Scoping of Multimedia (Edited by Prof. Tsu-han Chen)

EDICS	DESCRIPTION
1	SIGNAL PROCESSING FOR MEDIA INTEGRATION
1-CDOM	Compressed Domain Processing
1-CONV	Media Conversion
1-CPRS	Media Compression
1-JMEP	Joint Media Processing
1-PROC	3-D Processing
1-SYNA	Integration of Synthetic and Natural Audio/Video
1-SYNC	Synchronization
1-TCOD	Transcoding of Compressed Multimedia Objects
2	COMPONENTS AND TECHNOLOGIES FOR MULTIMEDIA SYSTEMS
2-ALAR	Algorithms/Architectures
2-CIRC	Low-Power Digital and Analog Circuits for Multimedia
2-DISP	Display Technology for Multimedia
2-EXTN	Signal and Data Processors for Multimedia Extensions
2-HDSO	Hardware/Software Codesign
2-MACH	Micromachining Devices for Multimedia
2-PRES	3-D Presentation
3	HUMAN-MACHINE INTERFACE AND INTERACTION
3-DSBL	User Interfaces for the Physically Disabled
3-MODA	Multimodal and Multimedia Environments
3-QUAL	Perceptual Quality and Human Factors
3-CONT	Presentation of Content in Multimedia Sessions
3-VRAR	Virtual Reality and Augmented Reality
4	MULTIMEDIA DATABASES AND FILE SYSTEMS
4-ANSY	Content Analysis and Synthesis
4-AUTH	Authoring and Editing
4-DLIB	Digital Libraries
4-KEEP	Indexing, Searching, Retrieving, Query and Archiving Databases
4-KNOW	Content Recognition and Understanding
4-SEGM	Image and Video Segmentation for Interactive Services
4-STRY	Video Summaries and Storyboards
4-TELL	Downloadable Descriptions of Scenes and Techniques
5	MULTIMEDIA COMMUNICATION AND NETWORKING
5-BEEP	Multimedia Traffic Management
5-HIDE	Error Concealment and Information Recovery
5-QOSV	Quality of Service

5-SECR	Security
5-SEND	Transport Protocols
5-WRLS	Wireless Multimedia Communication
6 SYSTEM INTEGRATION	
6-CADS	CAD Tools and Synthesis for Multimedia Systems
6-OPTI	System Optimization and Packaging
6-MMMR	Multimedia Middleware
6-SYSS	Operating System Support for Multimedia
6-WORK	System Performance
7 APPLICATIONS	
7-CONF	Videoconferencing and Collaboration Environment
7-CONS	Consumer Electronics and Entertainment
7-EDUC	Education
7-MEDS	Medicine
7-WEBS	WWW, Hypermedia and Internet, Internet II
8-STDS**	STANDARDS AND RELATED ISSUES

Attachment B.
Multimedia Systems and Applications Technical Committee (MSATC)
Draft Charter

March 26, 2001

I. Purpose

The objective of the Multimedia Systems and Application Technical Committee (MSATC) is to promote the exchange of information on the latest results from both the research and development communities of multimedia technologies, systems, and applications.

More specifically this Technical Committee should

Setting up the strategies and directions of multimedia systems and applications for the IEEE Circuits and Systems Society,
Assist the planning and paper review of the multimedia track of ISCAS,
Assist the planning and paper review of ICME,
Assist the paper review process of Transactions on Multimedia,
Sponsor other multimedia related workshops and conferences.

II. Composition of the Technical Committee

The Multimedia System and Application Technical Committee (MSATC) are composed of committee officers and committee members.

A. Technical Committee Officers

The officers of the technical committee include (1) Chairperson, (2) Secretary and Chair-elect.

The Secretary (and the Chair-elect) of the Technical Committee is elected from among the Technical Committee members for a term of two years. The election of the secretary is held during the ISCAS conference. The term of the Secretary and Chair-elect starts at the following January 1 after the election. The Secretary assumes the Chair position of the Technical Committee on the third January 1 after the election.

B. Technical Committee Members

New members of the Technical Committee are nominated by at least one of the existing members of the Technical Committee. The Chair of the Technical Committee needs to circulate the bio and position statement from the candidates, and conduct a vote within the Technical Committee. A simple majority vote is needed for the acceptance of the new members.

III. Technical Committee Meetings

A Technical Committee meeting must be held at each ISCAS and ICME. If necessary, interim

meetings can be called by the Technical Committee Chair or by a simple majority of the members and can also be held by electronic mail or by other means.

Technical Committee meetings are open to both members and non-members of the Technical Committee. However, only members of the Technical Committee will have the voting rights.

Technical Committee members are expected to attend the Technical Committee meetings either during ISCAS or ICME each year. The attendance requirement each year is established by attending either ISCAS or ICME (or both). Members who are not able to satisfy the attendance requirements for two consecutive years without giving sufficient cause are considered withdrawn from the Committee, subject to review by the Technical Committee.

Minutes will be taken by the secretary or other member of the Technical Committee designated by the Chair. The Chair will maintain minutes of the past Technical Committee meetings.

IV. Proxies

During meetings of the technical committee meeting, each voting member shall have one vote. A quorum both for face-to-face meetings and for email or phone meetings will be a majority (greater than 50%) of the number of franchised members of this Technical Committee. Written proxies may be submitted by electronic or postal mail to the secretary or the chair of this Technical Committee. Technical Committee members will be informed sufficiently in advance of any known motions to be voted on during a forthcoming meeting. The chair has the deciding vote in cases of tied votes.

V. Termination

The termination of this Technical Committee may be proposed either by the Circuit and System Society or this Technical Committee. Two thirds of the committee members have to approve the termination in the event that the termination is initiated by this Technical Committee.

VI. Amendments

Amendments to this charter require the approval by two thirds of the Multimedia Systems and Application Technical Committee members.

Document History: Submitted by _____ on _____

Attachment C.

Multimedia Systems and Applications Technical Committee Meeting Minutes(ISCAS2000)

31 May, 2000
Wednesday
12:20PM-1:30PM
Intercontinental Hotel
Leman Room

Attendees:

Chung-Sheng Li, Bing Sheu, Jie Chen, Wai-Chi Fang, Xinhua Zhang, Mohammed Ghanbari, Ming-Ting Sun, Chung-Yu Wu, Liang-Gee Chen, Peter Pirsch, Tian Qi, Wenwu Zhu, Mark Soudle, Sankar Basu

1) Approval of Minutes from 1999 MSATC Meeting in Orlando, FL

The minutes of the previous meeting in Orlando were unanimously approved.

2) Introduction of committee members and officers

Attendance introduced themselves. The officers include Chung-Sheng Li as the Chair, Liang-Gee Chen as the secretary and chair-elect. The term of the current chair will expire on Dec. 31, 2001. We will need to elect the secretary (and chair-elect) during our 2001 TC meeting in Sydney.

3) Report from Board of Governors

Peter Pirsch described discussions from the BOG meeting. One of the issue arising is the identity of the multimedia track within CAS vs. the multimedia tracks from the Computer, the Signal Processing, and the Communication Society. In particular, we probably have the largest overlap with the Signal Processing Society, both in terms of the area of interests and participations. One of the difficult challenges will be to establish a CAS identity within the multimedia community. The second challenge will be to establish a multimedia identity within the CAS. Our TC has some overlap with other TC's within CAS, and consequently this may become an issue when we have to organize sessions for ISCAS. We have a third issue regarding to whether and how to differentiate the multimedia track within ISCAS and ICME, which is supposed to capture all of the multimedia papers from now on.

4) Report from Technical Committee Chair Meeting

Chung-Yu Wu, our past chair of the TC, has explained that our TC will be leading the effort for organizing the Multimedia track within ISCAS starting from this year. The TC chair will be invited to organize the track program committee for reviewing the papers received within the multimedia track.

5) Technical activities

- a) ISCAS Multimedia track report
- b) SiPS'99 report: We had 115 attendees and 40 students. The workshop is a great success.
- c) ICME will be held at the end of July 2000.

6) Activities in CAS publications

Prof. Ming-Ting Sun, who has assumed the editor-in-chief for IEEE Trans. on Multimedia, has described the current status and challenges of the transaction.

7) TC membership

It was suggested that Chung-Sheng setup the by-law for the TC membership. Nomination for new TC members are open. Please send the name and resumes of candidates to Chung-Sheng. Chung-Sheng will follow the by-law and pass the materials of the candidates so that new members can be elected to the TC.

8) CAS Society Awards

It was suggested that Chung-Sheng contact all the past recipients of society awards and they would nominate someone from our TC for their prospective awards.

9) Other business/activities

- proposal for workshops: Jie Chen has organized a very successful special sessions during ISCAS 2000. There has also been a number of very successful tutorials sponsored or organized by the committee members. A number of special sessions and tutorials were proposed for ISCAS 2001.
- lectures/best paper award

10) Future TC meetings

The next TC meeting will be at ICME 2000 in New York.

Attachment D.

Multimedia Systems and Applications Technical Committee Meeting Minutes (ICME 2000)

Date: Aug. 2, 2000 (Wednesday)

Time: 11:45AM-12:40 PM (Luncheon)

Location: Hilton Hotel

Attendee (both MSATC members and observers) includes:

Chung-Sheng Li (chair), John R. Smith, Edward K Wong, Sankar Basu, Alex Loui, Chung J. Kuo, Ming-Ting Sun, Peter Pirsch, Nevenka Dimitrova, Alex James, Ana B Benitez, John Aa Sorensen, Yu Hen Hu, Min-Jen Tsai, Janet Chen, Ming-Syan Chen, Tsuhan Chen

Since we just had our committee meeting during ISCAS 2000 in Geneva, at the beginning of June, we focus our discussion on the following issues:

1. We would like to thank Sankar for his splendid and wonderful organization of the ICME conference, the first ever multimedia conference sponsored by four societies. During this conference, many of our committee members (including myself) have also helped out, including Ming-Ting being the steering committee member, Tsuhan co-chair the technical program. We would also like to acknowledge that Peter and John have done very successful tutorial during the pre-conference tutorial:
 - Peter Pirsch: Multimedia Processors: VLSI Architectures and Programming
 - John R. Smith: The MPEG-7 Multimedia Content Description Standard (John is not a formal member of our committee yet, but we will fix that later. :-))
2. Discussions of possible improvement of ICME, mostly on the no-shows and quality of the papers. A few people have complained about the no-shows even after the pre-registration requirement by the conference.
3. Discussion on how to improve the identity of the CAS inside ICME, the conclusion is
 - submitting more papers from the committee to those areas which are clearly CAS related multimedia areas
 - more active participation through proposing special sessions and tutorials
4. Possible special sessions for future ICME and ISCAS includes:
 - Nevenka Dimitrova - consumer electronics for multimedia
 - John R. Smith - system and applications based on MPEG-7