MULTIMEDIA COMMUNICATIONS TECHNICAL COMMITTEE   MMTC

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CONTENTS

The MultiMedia communications Technical Committee (MMTC) is a volunteer group that examines systems, applications, services and techniques in which two or more media are used in the same session. These media include, but are not restricted to, voice, video, image, music, data, and executable code. The scope of the committee includes conversational, presentational, and transactional applications and the underlying networking systems to support them.

MULTIMEDIA COMMUNICATIONS

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You can also navigate through MMTC mailing list archive (since Feb. 2004).
http://barbarian.comsoc.org/comsoc/org/multicomm/

Future MMTC Meetings
Globecom 2005, November-December 2005, St. Louis, Missouri, USA
day, during Globecom 2005.

CCNC 2006, January 2006, Las Vegas, Nevada, USA
day, during CCNC 2006.

CCNC 2006 MMTC Activities

(7-10 January 2006)
Technical Sessions
Special Sessions
Demonstrations
Tutorials
DRM Worskhop
NIME Workshop
HWN-RMQ Workshop

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A WORD FROM THE E-LETTER E-I-C   *Marco Roccetti*

The goal of the E-Letter is to disseminate issues that focus on opinions, initiatives, scientific achievements and perspectives of multimedia with an emphasis on the communication technologies.

The current issue of the E-Letter features a new perspective article in the bioinformatics field.

It was provided by Andrew J. Bangham, Beatriz de la Iglesia, from the School of Computing Sciences, University of East Anglia, and Giacomo Buratti, Danilo Montesi from the Department of Mathematics and Informatics, University of Camerino. In their article, titled "Data Model and Query Languages for Biological Databases", the authors discuss issues on the use of multimedia data models and query languages for biological databases.

We renew the invitation to everyone to become regular contributor by submitting proposals for columns, perspective articles and annotated bibliographies. Information for submissions can be found at the MMTC website:
http://www.comsoc.org/~mmc.

Enjoy this issue!

Marco Roccetti
Editor-in-Chief E-Letter

COSPONSORING / RELATED CONFERENCES AND WORKSHOPS

CCNC 2006

January 7 - 10, 2006

Las Vegas, Nevada, USA

IEEE Consumer Communications and Networking Conference (CCNC) will present the latest approaches and technical solutions in the areas of consumer networking, enabling technologies such as middleware and multimedia, and novel applications and services. CCNC 2006 will include a peer-reviewed program of technical sessions, technology application panels, tutorials, and poster/demo sessions.

ICC 2006

June 11 – 15, 2006

Istanbul, Turkey

ICC 2006 will be held in Istanbul, Turkey on 11 - 15 June 2006 under the theme of 'Bridging Continents Through Communications.' The technical program will consist of a general topic symposium, eight specific symposia, Business Applications and Executive Sessions , Tutorials, and Workshops. For the technical sessions, the ICC 2006 program committee is soliciting original papers describing state-of-the-art research and development in all areas of communications and networking. Prospective authors are invited to submit original technical papers for oral or poster presentations at ICC 2006 and publication in the Conference Proceeding. (IEEE Communications Society policy states that all accepted ICC 2006 technical presenters must register at the full or limited rate. For authors presenting multiple papers, one full or limited registration is valid up to three papers.) Proposals for Tutorials and Workshops are also invited. Scope of ICC 2006 includes, but is not limited to, the symposia topics listed below.

GLOBECOM 2006

27 November - 1 December 2006

San Francisco, California, USA

The objective of this symposium is to provide a platform for researchers and technologists to present new ideas and contributions in the form of technical papers, panel discussions, as well as, testbed implementations and realworld evaluation of many ideas in wireless communications.

CONFERENCE CALENDAR

CONFERENCE	LOCATION	INFORMATION
IEEE PIMRC 05 IEEE Symposium on Personal, Indoor & Mobile Radio Communications	September 11 - 14 2005 Berlin, Germany	http://inrg.cse.ucsc.edu/secon05/home.html
IEEE SECON 05 IEEE Conference on Sensor and Ad Hoc Communications and Networks	September 26 - 29 2005 Santa Clara, California	http://www.ieee-secon.org/2005
MILCOM 05 IEEE/AFCEA Military Communications Conference	October 17 - 20 2005 Atlantic City, NJ USA	http://www.milcom.org/2005/
IEEE DySPAN 05 IEEE Symposium on New Frontiers in Dynamic Spectrum Access Networks	November 8 - 11 2005 Baltimore, MD USA	http://www.ieee-dyspan.org/
GLOBECOM 05 IEEE Global Telecommunications Conference	November 28 - December 2 2005, St. Louis, Missouri	http://www.ieee-globecom.org/2005/
CCNC 06 IEEE Consumer Communications and Networking Conference	January 7 - 10, 2006, Las Vegas, Nevada, USA	http://www.ieee-ccnc.org/2006/
ICC 06 International Conference on Communications	June 11 - 15, 2006, Istanbul, Turkey	http://www.icc2006.org/
ICME 06 IEEE International Conference on Multimedia & Expo	July 9 - 12, 2006 Toronto, Ontario, Canada	http://www.icme2006.org/
GLOBECOM 06 IEEE Global Telecommunications Conference	27 November - 1 December 2006 San Francisco, CA USA	http://www.ieee-globecom.org/2006/

MMTC INTEREST GROUPS

Based on the research interests of MMTC members, several IGs have been initiated led by experts and active researchers in each area. Detailed info about the IG charters, focus areas of each IG, and their activities are announced at
http://www.comsoc.org/~mmc/
and through the reflector. The IGs are:

(MSIG) Media Streaming
   Chair: Pascal Frossard
   Vice-chair: Juan Carlos de Martin

(HNIG) Home Networking
   Chair: Prof. Madjid Merabti
   Vice-chair: Heather Yu

(MobIG) Mobile and Wireless Multimedia
   Chair: Prof. R. Chandramouli
   Vice-chair: Oliver Wu

(SecIG) Multimedia Security
   Chair: Suba Subbalakshmi
   Vice-chair: Deepa Kundur

(QoSIG) Quality of Service
   Chair: Qian Zhang
   Vice-chair: Apostolis Salkintzis

(ACIG) Interest Group on Autonomic Communications
   Chair: Xiaoyuan Gu
   Vice-chair: Jiang (Linda) Xie

Call for Chair Nominations, Volunteers, and Members:

IG Chairs Nomination and Volunteers: We encourage you to volunteer for the available positions. It is a great networking opportunity. Furthermore, it gives you new means to contribute to the technical activities and to promote your career in multimedia communications area. Nomination and volunteers should be sent to the MMTC chair via email.

IG Membership: Membership is free. Information about how to join each IG will also be available at each IG will be available at the MMTC Web site. Please stay tuned.

Interest Group on Autonomic Communications

A new IG has been approved, ACIG.
IEEE ACIG Membership gives you the opportunity
- to network with technical experts in Autonomic Communications,
- to contribute to the technical activities in Autonomic Communications.

Joining IEEE ACIG is free and easy. Simply go to the membership subscription page at:
https://www.ibr.cs.tu-bs.de/cgi-bin/mailman/listinfo/ieeeacig

The mailing list, ieeeacig@ibr.cs.tu-bs.de is the communication channel with the ACIG. To post a message to the list, send e-mail to
ieeeacig@ibr.cs.tu-bs.de.

The mail archives are located at:
http://www.ibr.cs.tu-bs.de/pipermail/ieeeacig

Related News and Events:
- *Call for Papers*: IEEE CCNC'06 Special Session on Autonomic Communications, Las Vegas, NV (7-10 January 2006).
- *Upcoming Conferences*: IEEE ICC 2006 General Symposium, Istanbul, Turkey (June 11-15, 2006).

AWARDS

MMTC Distinguished Service Award – Given to a MMTC member with exemplary service to MMTC over a sustained period of time.

Prize
Certificate and plaque.

Basis for judging
Exemplary service to MMTC over a sustained period of time.

Eligibility
- The nominee must be a MMTC member at the time of nomination.
- The nominee must have been a MMTC member for a sustained period of time.

Winner of the 2004 ComSoc MMTC Distinguished Service Award
Dr. Charles N. Judice
For his exemplary service to the Multimedia Communications Technical Committee and the multimedia communications community at large.

MMTC Best Paper Award – Given to an outstanding paper in the area of multimedia communications published in any ComSoc magazine, journal, or ComSoc sponsored conference in the previous two calendar years.

Call for Nominations
IEEE Comsoc Multimedia Communications Technical Committee will give a yearly award to the Best Paper in the multimedia communications area.

Prize
IEEE plaque signed by the ComSoc President.

Basis for judging
Any paper published in an IEEE Comsoc journal/magazine or in the proceedings of an IEEE Comsoc-sponsored conference/workshop/symposium, in the two years preceding the election.

Paper nominations have to be sent by email to MMTCawdcommittee@netscape.net, with subject line 'MMTC-BPA Nomination'.

The nomination should include the complete reference of the paper, author information, a brief supporting statement (maximum one page), the name of the nominator, and an electronic copy of the paper when possible. The hard deadline for paper nomination is November 15th, 2005. Additional information, and election by-laws are available on the MMTC website.

Winner of the MMTC best paper award 2004
A Cross-Layer Quality-of-Service Mapping Architecture for Video Delivery in Wireless Networks, by Wuttipong Kumwilaisak, Y. Thomas Hou, Qian Zhang, Wenwu Zhu, C.-C. Jay Kuo, and Ya-Qin Zhang, published in *IEEE JSAC*, December 2003.

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To all MMTC members: If your postal address, telephone or fax numbers have changed, please update them with the committee secretary. You can review our current records on our web page at http://www.comsoc.org/~mmc/.
If you like to join MMTC Mailing List, the indications how to subscribe/unsubscribe are reported at http://www.comsoc.org/~mmc/membership.html.

PERSPECTIVE ARTICLE   *A.J. Bangham, B. de la Iglesia, G. Buratti, D. Montesi*

Data Model and Query Languages for Biological Databases

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Abstract- **The study of biological data, a very stimulating example of multimedia data, has gained much attention over the last few years. This poses serious challenges for computer scientists, which must manage a complex scenario involving several aspects, mainly in the area of database management. In this position paper we analyze the kind of data we have to deal with. We show that a lot of research has been done in various fields, each of which only partially addresses the defined needs. We envision a future unified approach to those issues.**

I. INTRODUCTION

Multimedia databases [1] can be defined as collections of media objects of different types. In other words, a multimedia database consists of some images, some videos, some documents, and some audio files, as well as, perhaps, more traditional data types such as relational data and object-oriented data representation. A *Multimedia Database Management System* (MMDBMS) must have the ability to uniformly query data represented in different media and formats, stored locally or remotely, which typically occupy tremendous amounts of space; moreover, it must present the results of a query in a way suitable for the type of content, possibly satisfying various quality of service requirements.

Many commercial and experimental MMDBMS have been proposed. Moreover, traditional relational database systems have been extended in order to store multimedia content, generally by using BLOB (Binary Large OBjects) data fields; in this case, anyway, the DBMS just stores the binary representation of the object, the management of such content being demanded to application-specific extensions.

Multimedia databases have gained much attention over the last few years, mainly because of the increase of available data that are not always easy to describe with mere symbols; this process is evident in many application areas. Here we focus on a very

interesting kind of multimedia databases: biological databases. The study of biological data involves many aspects in the area of database management; a list that includes spatiotemporal data, semi-structured data, data mining, techniques for managing uncertainty and imprecision. Each of these aspects has been the subject of study by computer scientists as stand-alone subjects, but no comprehensive theory has emerged that integrates the different aspects. In this paper we review the current proposed approaches and try to envisage possible future research directions.

In Section II we summarize the classical tasks in studying biological data; then we try to imagine a scenario for a future application which presents many interesting issues. Section III analyzes the various aspects involved in the scenario previously described, proposing existing data models which suit the needs; then in Section IV valid query languages for these data models are presented. Finally in Section V we draw some conclusions and clarify interesting open issues.

II. STUDYING BIOLOGICAL DATA

The standard approach in studying biological data can be summarized with the following steps: 1) make observations; 2) infer a model; 3) use simulation to make predictions; 4) compare the predictions with observations; 5) infer from the residual error a better revised model; 6) converge to an explanation of the data that is captured in the model.

The observations refer to various particular aspects of a whole organism, e.g. morphology, metabolome, gene expression etc., and need to be integrated. In order to keep the process of integration simple, scientists have to choose a suitable organism. The choice of the organism to study should also be driven by the need to promptly test the inferred models; what is needed is an "accelerator", i.e. a living organism complex enough to be taken as representative sample,

simple enough to be manageable, and whose life cycle is short enough to be completely observed by scientists. Biologists call such an organism a 'model' but here we reserve the term for computational models.

A. How might the database be used?
Imagine a web page showing a model of a growing plant. When it reaches the flowering stage the user can click on a bud to zoom in closer and see the early petal shapes. By clicking on any part the user drop straight into the original research paper. By switching views he can see gene expression patterns and click through to find the genes in the genomic database. In another set of views he can zoom into a predictive model covering circadian rhythms associated with growth; such proposed models can be compared with observed data, which are labelled according to where and when the observations were made. Using this spatio-temporal framework an international community of scientists can jointly work on one complex problem through the world-wide-web.

III. DATA MODEL

A. Spatial and temporal data
As already said, observations must be labelled according to where and when they were made relative to the plants development; these data can therefore be mapped in a **spatio-temporal model** [2].
Suppose we want to store in a database a set of leaves. Using a traditional relational database, there is no easy way to express leaves shape and position in the three-dimensional space. One could think to store the vertices of polyhedrons, e.g. rectangular prisms, that approximate the shape of the leaves. Using this solution, even simple queries like "Is the point (x, y, z) in the database?" should be expressed in a rather complicated way; intuitively, queries such as the above can be stated more naturally if the user could think about the database as though it contained all the points in each leaf.
The key idea behind the **Constraint Database Model** [3] is to store a finite representation in the form of the set of constraints describing the data. For example the set of points contained in a rectangle whose vertices are (1,1) and (3,6) can be described as the following conjunction of constraints: $(1 \leq x \leq 3) \wedge (1 \leq y \leq 6)$. The same approach can be obviously used with different kind of polygons or with three-dimensional objects, so it is possible to store a more precise approximation of leaves shape and query such database.

The constraint model can be useful to deal with temporal data too. Spatial and temporal data are closely interconnected in the biological area; in fact leaves can change their position, flop, bend etc. during time, and modeling plant evolution involves tracking these changes without losing information on the properties of the leaves. Thus, spatial properties of a leaf should be stored in a way (e.g. through coordinates that are relative to the stem, or better, relative to the plant) that captures the evolution of both each single leaf and the plant as a whole. Moreover, a question arises regarding the granularity of such tracking; we mean that it could be necessary to analyze data at different resolution levels, e.g. in order to reduce the "noise" due to weather conditions (wind, rain etc.).

B. Semi-structured data
One of the features considered in the use cases is the necessity to mix different kind of data. Data reside in different forms, ranging from completely unstructured data (e.g. images) to highly structured data in relational database systems. This kind of data, that are neither raw data nor strictly typed, are called **semi-structured data**.
Semi-structured data can be represented graphically by labelled graphs. Nodes represent objects, which can be simple or complex; complex objects are connected with other objects by labelled arcs, while atomic objects have an associated value. Figure 1 shows a graph representing a set of plants and a set of papers dealing with them.
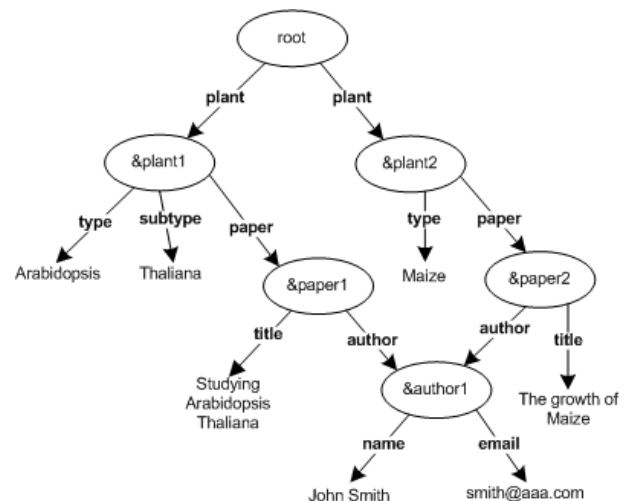

Fig. 1. A graph representing semi-structured data

Semi-structured data can be a useful paradigm when dealing with biological data for another reason too. As we said, an international community of scientists could jointly work on one complex problem through the use of the world-wide-web. It is natural to imagine that each working unit will store data related to its own experiments locally, while only a part of these data should be made available to the rest of the community. This scenario poses the problem of integrating multiple data sources by semi-automatically matching different schemas, and the use of semi-structured data is definitely well suited for this purpose.

C. Uncertainty and Data Imprecision
Most research into the development of databases has assumed that the database is "complete" and "perfect" in the sense that no data items are missing and that all the data contained in the database is perfectly accurate. However, real-world information is rarely complete, and its accuracy is very difficult to guarantee.

Even in the area of biological databases, the issue of uncertainty is present. It is natural to imagine that a measure (for example the area of a leaf) can be imprecise, i.e. we could know that a measure lies in an interval without knowing its precise value; more, scientists could make different incompatible predictions about the growth of a leaf, each of which can be labelled with the probability to become true.

Two main extensions of the relational model has been proposed to incorporate uncertainty: lattice-based relational databases [2] (which extends another model called Fuzzy Sets) and probabilistic relational databases [4]. Both of them model uncertainty by assigning a probability to the data; the main difference is that the first model associates a probability to each tuple, while the latter one associates a range of probabilities to each attribute of a tuple. The standard relational operators are then extended to deal with uncertainty; some SQL extensions can be used in order to specify the semantic to be used while computing certain algebra operators.

Recently there has been proposals to incorporate the notions of uncertainty and imprecision in the context of semi-structured data.

IV. QUERY LANGUAGES

A. Spatial and temporal data
There are currently no clear standards for querying constraint databases. Therefore we will examine two separate approaches to deal with spatial and temporal data: Geographic Information Systems and Temporal Databases.

Geographic Information Systems (GIS) deal with collecting, modelling, storing, manipulating, and displaying geographic information. Any geographic object has *thematic* attributes, that describe the object, and a *spatial* attributes, that describe the location, shape, orientation, and size of the object in two- or three-dimensional space.

Recent GIS products provide a database approach to the modelling of geographic information. However it is clear that the current GIS model is not completely satisfactory: spatial and non-spatial attributes are not modeled in the same way, there is no dimensional extensibility to the model, there is not a framework for representing and querying geographic information that varies in time. Contrariwise, the main advantage of the constraint approach is that it is a natural extension of the relational model, and is not limited to two-dimensional data.

For what concerns **Temporal Databases**, the widely accepted extension to SQL is the Temporal Structured Query Language [5], or **TSQL2**, that timestamps tuples with sets of bitemporal chronons. Each bitemporal chronon represents a rectangle in validtime/transaction-time space; the valid time concerns the time a fact was true in reality, while transaction time concerns the time the fact was present in the database as stored data.

TSQL2 provides several powerful constructs, such as *restructuring* (getting all the periods the projection of a tuple was valid), *partitioning* (getting a different tuple for each maximal period during which the tuple was valid) and *intersection* (getting the tuples which was valid during a specified period).

B. Semi-structured data and XML
The most natural way to represent semi-structured data seems to be the use of **XML** (eXtended Markup Language) documents. XML expresses information using four basic components: *tags*, *attributes*, *data elements* and *hierarchy*. A document is made by nested tags; each tag has a name and can have attributes, sub-elements and a data content. An XML document can therefore be seen, at a simple level of abstraction, as an ordered tree, where nodes are labelled and can have an associated value. There are however techniques to create references between elements, thus making it possible to represent a graph structure. Figure 2 shows an XML document representing the graph in Figure 1.

```
<root>
  <plant>
    <type>Arabidopsis</type>
    <subtype>Thaliana</subtype>
    <paper authorid="1">
      <title>Studying Arabidopsis
        Thaliana</title>
    </paper>
  </plant>
  <plant>
    <type>Oak</type>
    <paper authorid="1">
      <title>The growth
        of Oaks</title>
    </paper>
  </plant>
  <author id = "1">
    <name>John Smith</name>
    <email>john@aaa.com</email>
  </author>
</root>
```

Fig. 2. An XML document representing the graph in Figure 1

Many efforts have been done in the last years to provide suitable languages for data definition and manipulation; the main candidates to become standard are **XMLSchema**, which permits to define the structure of a document, **XPath**, which enables to address parts of an XML document, and **XQuery** [6], which makes it possible to build complex queries that extract data from an XML document and restructure the content.

V. CONCLUSIONS AND OPEN ISSUES

We have shown that the study of biological data involves many aspects, ranging from classical data management to complex analysis and predictions; various other topics that are also relevant, such as the use of Data Mining techniques to extract knowledge from vast amount of data and advanced data visualization techniques, has not been addressed here. Some of the involved area have well defined data models and languages, while most of them have still open research issues. We expect that researchers will further investigate each separate issue we reviewed, particularly in those fields (like semi-structured data) which still miss widely accepted models and languages.

Moreover, in view of the development of a complete theory for biological databases, it would be very useful to devise a comprehensive data model which capture all the features previously described. Some proposals have been done to extend relational algebra towards semi-structured data; following this path, we expect to see a more general algebra, whose operators can deal with uncertainty, imprecision, spatial objects, temporal constraints. Such an algebra could represent the basis towards the definition of query language which unifies the various extensions to the classical SQL that we have shown in this review.

REFERENCES

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ABOUT THE AUTHORS

Andrew J. Bangham obtained his Ph.D from University College of London, UK. He is presently Head of School of Computing Sciences at the University of East Anglia,Norwich, UK. Recently he is contributing to biology research on computational methods for extracting data on plant shape and ways to relate the results to mathematical models of plant development.

Beatriz de la Iglesia obtained her Ph.D from University of East Anglia, UK, in 2001. Since 2002 she is Lecturer in Health Informatics at the University of East Anglia. Her research interests are in the area of health informatics; she is particulary interested in the application of knowledge discovery techniques to health data.

Giacomo Buratti obtained his Master Degree in Computer Science from University of Bologna, Italy, in 2003. He is currently working towards his Ph.D. degree in the faculty of Science and Technology, University of Camerino, Italy. His principal interests are in the area of semi-structured data with special attention to data integration.

Danilo Montesi obtained a Ph.D in Computer Science from the University of Pisa in 1993. Since 2002 he is full professor of Database and Information Systems at the University of Camerino. His principal interests are in the area of data management with special attention to data modeling, rule and query languages for semi-structured imperfect data.

CALL FOR CONTRIBUTIONS

Call for Contributions per Annotated Bibliographies for
The Multimedia Communications Technical Committee
E-Letter
Editor in Chief: Marco Roccetti
IEEE Communications Society

The E-letter of the Multimedia Communications Technical Committee of the IEEE Communications Society is an electronic publication that welcomes submissions of annotated bibliographies.

A considerable barrier to entry into a new field of research is to become aware of the existing literature on the topic. The Internet and search engines -such as IEEExplore and, more recently, Google Scholar- have made access conference proceedings and journals immensely easier than it used to be.

However, speed and ease of access, by themselves, do not solve the problem of understanding the state of the art in a given field. Some form of intelligence is needed to filter the raw data represented by the very large number of available publications. Such intelligence may be acquired, in due time, by reading and attending conferences - or it may come from experts already working in the field.

To help fellow engineers and researchers to gain easier access to new fields of activities, the E-Letter of the Multimedia Communications Technical Committee (MMTC) invites multimedia experts to submit annotated bibliographies on topics of their choosing.

It is expected that the annotated bibliographies could be of various kinds – from tutorial level bibliographies on the general field of multimedia communications to bibliographies on very specialized subtopics.

If technically feasible, we will adopt an open approach to bibliographies development. Instruments such as wiki are, in fact, making very easy to build knowledge repositories in a collaborative fashion, as shown, for instance, by the astounding success of wikipedia.org. Initial contributions could, therefore, if the original author agrees, be placed on a MMTC wiki to be integrated by comments and modifications made by the community at large. The E-letter will periodically publish selected annotated bibliographies.

Possible topics for annotated bibliographies include, but are not limited to:

- Hardware and Software for Multimedia
- Home Networking for Multimedia
- Implemented Prototypes
- Mathematical Modeling and Simulation for Multimedia
- Mobile and Wireless multimedia
- Multimedia Communication Systems
- Multimedia Security
- Multimedia Design
- Multimedia Development Tools
- Multimedia Networking and Quality of Service
- Networked Multimedia Entertainment
- Quantitative and Qualitative Studies for Multimedia
- Streaming Multimedia
- Theoretical/Ergonomic Issues Regarding Multimedia Communications

Annotated bibliographies will be subject to peer review and, upon acceptance, published in an upcoming issue of the E-Letter. All authors should consider the general nature of the E-Letter's readers. Annotated bibliographies should not have been previously published and must not be submitted for publication as well.

Submission guidelines are as follows: length should be no more than 3000 words (four double column pages).

Annotated bibliographies should be submitted in pdf format by e-mail to the E-Letter Assistant Editor J.C. De Martin at demartin@polito.it.

Deadlines:
The next issue of the E-Letter will appear on August 2005. Our deadline for receiving annotated bibliographies articles is 60 days prior to the cover date.

CALL FOR CONTRIBUTIONS

Call for Perspective Articles for
The Multimedia Communications Technical Committee
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Editor in Chief: Marco Roccetti
IEEE Communications Society

Multimedia technology, networks and services are making productive use of important innovations in technical parallel fields: from signal processing and compression to storage and switching devices; from satellite and fiber -based communications to computer graphics and animation; from mobile and wireless systems to information security. A beneficial aspect of this phenomenon is that it is pulling together an extremely diverse group of experts specializing in technical converging areas. Even though such an ever-evolving environment promotes interdisciplinary fusion, however, teachers, researchers and professionals of the discipline need access to the most current information about the concepts, issues, trends and technologies in this emerging field. The **E-Letter** of the **Multimedia Communications Technical Committee** wishes to become a fast medium that provides a comprehensive coverage of the most important definitions, concepts, issues, trends and technologies in the field of multimedia communications technology. To this aim, the **E-Letter** of the Multimedia Communications Technical Committee welcomes submissions of Perspective Articles. Perspectives are articles written from the point of view of an expert in the multimedia technology field. They should focus on a particular technology or technology-related issue and how that technology or technology-related issue is being implemented and is impacting the multimedia arena. The E-Letter is seeking perspective articles on the subject of multimedia as it applies to the broad spectrum of multimedia communications. Also manuscripts for short essays and opinions may be considered.

Possible topics include, but are not limited to:
- Hardware and Software for Multimedia
- Home Networking for Multimedia
- Implemented Prototypes
- Mathematical Modeling and Simulation for Multimedia
- Mobile and Wireless multimedia
- Multimedia Communication Systems

- Multimedia Security
- Multimedia Design
- Multimedia Development Tools
- Multimedia Networking and Quality of Service
- Networked Multimedia Entertainment
- Quantitative and Qualitative Studies for Multimedia
- Streaming Multimedia
- Theoretical/Ergonomic Issues Regarding Multimedia Communications

Selected articles will be peer-reviewed and, upon acceptance, published in an upcoming issue of the E-Letter. All authors should consider the general nature of *E-Letter's* readership. Manuscripts should not have been previously published and must not be submitted for publication elsewhere. The **basic format to follow** is:
- Introduce the technology or issue being discussed.
- Discuss the technology's current or future impact on multimedia communications.
- Discuss pros and cons of the technology/issue.
- Discuss what the author is doing regarding this technology/issue.

Other Guidelines are as follows:
- Length should be no more than 2,000 words (three double-column pages).
- Articles should contain no more than 3 Figures. Figures and tables count for 300 words.
- Articles must contain no more than six references.
- Articles should be submitted in a .pdf format by e-mail to roccetti@cs.unibo.it.

Deadlines:
The next issue of the E-Letter will appear on August 2005. Perspectives are generally scheduled far in advance. Our deadline for receiving completed articles is 60 days prior to the cover date. We may accept some material later than that, but special arrangements must be made in advance with the Editor.

CALL FOR CONTRIBUTIONS

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Call for Columns for
The Multimedia Communications Technical Committee
E-Letter
Editor in Chief: Marco Roccetti
IEEE Communications Society

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The **E-Letter** of the **Multimedia Communications Technical Committee** features columns written by recognized experts in all the technological fields related to multimedia communications. Columns should give to all the multimedia community partners a possibility to voice their views on the issues, challenges, and opportunities facing industry and academia in connection with the field of multimedia communications. Columns featured by the E-Letter of the Multimedia Communications Technical Committee are intended to become a fast medium that provides a comprehensive coverage of the most important issues, concepts, definitions, trends and techniques in the field. To this aim, the E-Letter is looking for a group of insightful and diligent volunteers to serve as regular (or sporadic) columnists on the 2004-2005 term. Columns will be considered on all the aspects of multimedia communications. The E-Letter offers an unparalleled opportunity for potential columnists to express thoughts and opinions to a community-wide audience provided that the following instructions are followed.

What does it mean to be a columnist for the E-Letter?
It means keeping informed about multimedia issues, as well as news and scientific headlines. It means thinking about the issues that matter to readers in the context of the multimedia communications community. It means undertaking substantial research. It means writing clearly and effectively (perhaps provocatively) to demonstrate an opinion piece that can be easily followed.

What is a column for the E-Letter?
Columns are very brief articles in form of opinions, short essays, or news written from the point of view of an expert. Even though a column is, in essence, a timely and relevant piece of opinion writing, each good E-Letter column should relate an opinion to the most relevant topics of the multimedia community. Also controversial issues can make for a great column, but only if they sound interesting for the multimedia community.

Who can be a columnist for the E-Letter?
Well known experts, skilled practitioners, professionals and researchers are welcome to submit ideas for E-Letter columns. Also contributions from Chairs or members of the various Interest Groups of the Multimedia Communications Technical Committee, as well as from any member of ComSoc, discussing issues related to the activities of their groups, are greatly appreciated. The real and final qualification is having something interesting to say about multimedia communications and its surrounding community, and a willingness to put in the necessary time and effort.

Selected columns will be evaluated by the E-Letter Editor and, upon approval, published in an upcoming issue of the E-Letter. The basic format to follow is:
- Length should be no more than 700 words in length (one double-column page).
- Columns should contain no Figures.
- Columns should contain no References.
- Columns should be submitted as plain text (ASCII) by e-mail to roccetti@cs.unibo.it.

Deadlines:
The issue of the E-Letter will appear on August 2005. Our deadline for receiving columns is 15 days prior to the cover date. We may accept some material later than that, but special arrangements must be made in advance with the Editor.