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Dumitru Dan Burdescu
Guest Editor

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Recent advances in computing, networking, storage, and information technology have enabled the collection and distribution of vast amounts of multimedia data in a variety of applications such as entertainment, education, environmental protection, e-commerce, public safety, digital government, homeland security, and manufacturing.

The concept of multimedia from the traditional idea of 'multi-mediums' such as text, photographs, sides, video and audio tapes (analogue) is being redefined by the use of new computer concepts to integrate the digitized information to include text, graphics, sound, animation and full-motion. The dreams of multimedia technologists have come true and today we are able to store, transport, access and manipulate digitized multimedia information by simple drag and drop actions or export/import information to and from distant locations. The proliferation of image capturing devices and their diverse applications have enabled multimedia technology to contribute in the advancement of almost every aspect of human life. Multimedia research has evolved at tremendous speed in the last few decades to capitalize on the breadth of such applications, ranging from image/video coding and processing to multimedia communications to the analysis of human behavior to medical diagnostics. Multimedia researchers are now well-equipped to address many challenging and complex problems in various disciplines with innovative applications of more traditional image/video analytics and this Special Issue of International Journal of Computer Science and Applications (IJCSA) is an excellent example to testify this.

Multimedia field has dramatically grown in the last 20 years. In the last decade, substantial progress has been made in multimedia creation, transmission, presentation and analysis to facilitate the development of large-scale multimedia information systems. Together with the maturation and deployment of semantic web technologies, it is now possible to build a new generation of multimedia applications that enables large-scale semantic representation, analysis, and delivery of multimedia data from heterogeneous data sources. However, there is still a long way to go for mature solutions of multimedia database systems that are capable of processing semantics-rich, large-volume of multimedia data.

Big data is an emerging hot research topic due to its pervasive application in human society, such as government, climate, finance, and science. Currently, most research work on big data falls in data mining, machine learning, and data analysis. However, these amazing top-level killer applications would not be possible without the underneath support of networking due to their

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extremely large volume and computing complexity, especially when real-time or near-real-time applications are demanded. To date, big data is still quite mysterious to various research communities; in particular, the networking perspective for big data is seldom tackled to the best of our knowledge. Many problems are yet to be addressed, such as optimal network topology for big data, parallel structures and algorithms for big data computing, information retrieval in big data, and network security and privacy issues in big data.

Today, there are lots of heterogeneous and homogeneous media data from multiple sources, such as news media websites, micro-blog, mobile phone, social networking websites, and photo/video sharing websites. Integrated together, these media data represent different aspects of the real-world and help document the evolution of the world. Consequently, it is impossible to correctly conceive and to appropriately understand the world without exploiting the data available on these different sources of rich multimedia content simultaneously and synergistically. Cross-media analysis is a research area in the general field of multimedia content analysis that focuses on the exploitation of the data with different modalities from multiple sources simultaneously and synergistically to discover knowledge and understand the world. Specifically, we emphasize two essential elements in the study of cross-media analysis that help differentiate cross-media analysis from the rest of the research in multimedia content analysis or machine learning. The first is the simultaneous co-existence of data from two or more different data sources.

Education is one of the most important application areas for multimedia technologies. Universities and other educational institutions enhance their educational portfolio by using new technologies. Video and audio capture of lectures has become a common practice to produce e-learning content. Simulations allow to explore experiments which would be too expensive or too dangerous to be conducted physically by students. Multimedia-powered demonstrations are freed from many physical restrictions such as the availability of an object to study or the timescale of an effect to observe. Teaching enriched by vivid presentations and possibilities for interaction for students can also gain from improved learner's motivation. With the present amount of produced educational data, there is a high demand in techniques and methods capable of handling multimedia contents adequately. Educational content has to be presented, deployed, stored, navigated, searched, retrieved, edited, combined, and reused in a proper way. Furthermore, quality control and learning processes with feedback loops are considered to be important concepts for more effective and sustainable e-learning solutions. Multimedia technologies facilitate the evaluation, improvement, and assurance of quality in loopback controlled e-learning processes.

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These key technologies are creating a multimedia revolution that will have significant impact across a wide spectrum of consumer, business, healthcare, educational, and governmental domains. Yet many challenges remain, especially when it comes to efficiently coding, processing, indexing, mining, querying, searching, retrieving and visualizing multimedia data. Difficult research challenges involve the adaptation of intelligent software tools to the tight requirements posed by modern application.

The Multimedia - Processing and Applications (MMAP) Symposium within the framework FEDERATED CONFERENCE ON COMPUTER SCIENCE AND INFORMATION SYSTEMS (FedCSIS) addressed several themes related to theory and practice within multimedia domain. The enormous interest in multimedia from many activity areas (medicine, digital government, e-commerce, public safety, entertainment, education) led researchers and industry to make a continuous effort to create new, innovative multimedia algorithms and applications. From papers that were accepted at MMAP 2014 we selected and invited the best 8 extended papers for publication in this special issue.

Dumitru Dan Burdescu
Guest Editor

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