Guest Editorial
Special Issue on Multimedia Services Provision Over Future Mobile Computing Systems

EMERGING types of wireless applications and mobile computing services, rich in multimedia content with high demands for network resources and strict quality of experience (QoE) requirements, put more and more pressure for further research on efficient multimedia services provision over cellular systems, raising the need for novel applications development and delivery management techniques, as well as creating new challenges in standardization activities, in terms of multimedia quality evaluation. The incredible evolution of multimedia-capable mobile devices (e.g., smart phones, netbooks, and tablets), as well as modern advances in telecommunication networks and multimedia technologies, has led to a number of research efforts, dedicated to adopt advanced multimedia techniques, including content processing/analysis, scalability issues, and cross-layer optimization methods for audio–visual services support. A large number of content providers support delivery of services, rich in multimedia content, through sophisticated wireless network platforms. Such services include real-time digital audio–visual content, as well as streaming and teleconference applications hosting high-definition video and audio of increased quality. In addition, several wireless network platforms support the provision of user-centric applications, allowing mobile users to create, manipulate, and deliver their own multimedia content, using handheld devices.

Motivated by further examining recent advances in this field and promoting the optimization of the existing methodologies and/or approaches, this Special Issue aims to present recent advances in multimedia services provided over energy-efficient mobile computing environments, toward alleviating associated problems and addressing related challenges. More specifically, the target of this Special Issue is to foster dissemination of high-quality research in the interrelated scientific fields and present future directions, in terms of energy-efficient, high quality multimedia services provision over mobile computing systems, as well as novel multimedia processing technologies with emphasis on mobile applications.

Eleven papers were selected out of 31 submitted, which were reviewed by qualified anonymous referees according to the practices of this journal. These papers cover a variety of important and challenging topics in the area of mobile computing systems and multimedia.

In "QoE Power-Efficient Multimedia Delivery Method for LTE-A," Mushtaq *et al.* present a downlink scheduler and a QoE power efficient method for LTE-A, which are exploited to efficiently allocate the radio resources, optimizing the use of UE power using the DRX mechanism.

In "Energy-Efficient Adaptive Transmission of Scalable Video Streaming in Cognitive Radio Communications," Jiang *et al.* present an approach, where the scalable video coding and transmission rate adaptation are jointly considered in an energy-efficient scheme for transmissions of streaming media over cognitive radio networks with QoS guarantee.

In "Broadcasting Free-Viewpoint Television Over Long-Term Evolution Networks," Zarb and Debono propose a scalable FTV broadcast architecture for long-term evolution cellular networks. To alleviate complex processing on mobile receivers, depth maps are estimated in the cloud and transmitted along the multiview video.

In "Video Streaming Over Vehicular Networks Using Erasure Codin," Mammeri *et al.* propose the modification of the RTP using the erasure coding technique to address the high packet loss rate of VANETs and developing two converters.

In "Energy Optimization for Bidirectional Multimedia Communication in Unsynchronized TDD Systems," Zorba and Verikoukis present an energy allocation, in order to compensate the unsynchronization in the percentage allocation, where the objective is to guarantee minimum quality of service satisfaction at all receivers, while the least amount of energy is consumed.

In "Seamless Streaming Data Delivery in Cluster-Based Wireless Sensor Networks With Mobile Elements," Cheng *et al.* propose a seamless streaming data delivery protocol for multihop cluster-based WSNs with MEs, concentrating on the localized mobility support for the delivery of streaming data.

In "A Cross-Layer Optimized Scheme and Its Application in Mobile Multimedia Networks With QoS Provision," Vo *et al.* propose a novel CL design for integrated real-time/non-real-time traffic with strict preemptive priority via a finite-state Markov chain. The main strategy of the CL scheme is to design a Markov model by explicitly including adaptive modulation and coding at the physical layer, queuing at the data link layer, and the bursty nature of multimedia traffic classes at the application layer.

In "Optimal Wideband LPDA Design for Efficient Multimedia Content Delivery Over Emerging Mobile Computing Systems," Zaharis *et al.* elaborate on the IWO method that has been chosen to optimize an LPDA for operation in the frequency range of 800–3300 MHz. Due to its excellent performance, the

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LPDA can effectively be used for multimedia content reception over future mobile computing systems.

In "Enabling the Mobile Cloud Through an Evolutionary Market-Based Approach," Chilipirea *et al.* study incentives for mobile cloud systems and consider as a solution an evolutionary market-based approach to create these incentives. Creating a market for these systems is particularly difficult because of the large number of individuals that need to be involved and their high mobility.

In "Energy-Efficient Multimedia Data Dissemination in Vehicular Clouds: Stochastic Reward Nets Based Coalition Game Approach," Kumar *et al.* investigate an energy efficiency issue for multimedia applications in a vehicular cloud environment. The problem of energy efficiency is formulated as a stochastic reward nets based coalition game, in which vehicles are assumed as the players that formulate the coalition among themselves using a predefined criteria based on the demand generated and the available resources at the nearest cloudlet.

In "FDASH: A Fuzzy-Based MPEG/DASH Adaptation Algorithm," Vergados *et al.* present the novel scheme called FDASH which encompasses rate adaptation along with fuzzy logic in order to control the buffering time and the video resolution delivered to the client for error-free distribution of video segments, whereas at the same time guaranteeing the video quality based on the rate, the delivery of the undisrupted video playback, as well as the frequent changes in the quality of the video.

These papers appeared in the June 2016 issue of this JOURNAL.

We would like to thank all authors who submitted papers, including those whose papers were not selected for this Special Issue. A special note of thanks goes to all of the referees for donating their abundant time and effort. Without them, this Special Issue would not be possible. We hope that contributions in this Special Issue will stimulate further research in the important area of mobile computing and multimedia.

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