Editorial

Multimedia Networking

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Multimedia contents (animation, audio, and video) are becoming increasingly popular on the Internet and are being accessed by a variety of networked devices through either wired or wireless links. A large number of distributed multimedia applications have been created, including Internet telephony, Internet videoconferencing, on-demand streaming or broadcasting, IPTV, distance learning, entertainment and gaming, multimedia messaging, and so forth. Streaming real-time and on-demand audio and video over the Internet, local and wide area wireless networks have become a reality and will soon become a mainstream means of communication. To accelerate the adoption of these new emerging applications, a number of important issues must be addressed such as the architecture and design of multimedia communication systems, the quality-of-service (QoS) provisioning, the network and content security, and so forth. In this special issue on multimedia networking, we have invited a few papers that address such issues.

The first paper of this special issue addresses the system architecture and mobility management for mobile immersive communications, for both fixed and mobile clients, based on a distributed proxy model. Three possible methods for updating proxy assignments in response to mobility were proposed and their performances are compared. The second paper presents the study on the quality metric that integrates both the geometry resolution and realistic texture resolution, which is an important factor in the design of effective interactive online 3D systems. The third paper is on the efficient delivery of interactive multiview video, leveraging IP multicast, which can support a large number of users while keeping a high degree of interactivity and consuming low bandwidth.

The fourth paper of this special issue presents a fully distributed protocol, scalable island multicast, that effectively integrates IP multicast and application layer multicast (ALM) for media streaming, which brings in lower end-to-end delay lower link stress and lower resource usage than

traditional ALM protocols. The fifth paper describes a video surveillance system based on JPEG2000 that allows for transmission of the scene over limited bandwidth networks. The core of the system is a low-complexity transcoding technique that adapts the quality and resolution of the scene based on the available bandwidth with an adaptive rate control algorithm. The two subsequent papers address the bandwidth estimation for wireless streaming using the information from the lower layer of the protocol stack, and the technique to mitigate the impact of the imprecise rate estimation by scheduling with a conservative delay, respectively.

The eighth paper proposes to use signal-to-silence ratio (SSR) as an indication to the channel state information, which in return is used in a cross-layer protocol. An active queue management technique was proposed to differentiate corrupted packets. Such side-information-(SI-) aware processing provides significant performance gain over SI-unaware schemes. The final paper of this special issue is more forward-looking. It presents a new scheme that integrates multiple-description coding (MDC), error-resilient video coding, and unequal error protection with a hybrid space-time coding structure for robust video transmission over the MIMO-OFDM system.

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