Multimedia has become the computer buzzword of the 1990s. This seemingly sudden emergence, however, has resulted from steady progress in digital image/video capture, storage, and display technologies during the past 30 years and from the availability of fast and inexpensive hardware and software systems. Multimedia systems take on many forms, from the isolated PC with a CD-ROM drive to the millions of interconnected workstations containing the distributed data sets that make up the World Wide Web. Multimedia systems are utilized for fun, education, research, and business.

This special section on multimedia systems contains eight papers that address several of the technological issues dealing with image/video data sets in multimedia systems. The following aspects of multimedia systems are addressed:

1. special-purpose image/video codec design
2. video on asynchronous transfer mode (ATM) networks
3. temporal video segmentation
4. transform domain processing of image data
5. software architecture issues.

Application-specific image/video codec design can achieve improved storage/transmission times for many data sets. The paper “Progressive technique for human face image archiving and retrieval” by Bell and Maeder proposes an image codec specifically for databases of human faces. Barnett and Bovik, in the paper “Motion-compensated visual pattern image sequence coding for full-motion multisession videoconferencing on multimedia workstations,” develop a video codec that has a real-time software-only implementation on a PC. The paper “Image scalability using wavelet vector quantization” by Panchanathan, Gamaz, and Jain introduces an image codec for progressive image transmission applications based on a scalable VQ system and a wavelet decomposition.

Two papers in this special section study video on ATM networks. The paper “Characterizing highly correlated video traffic in high-speed asynchronous transfer mode networks” by Shroff and Schwartz forms a statistical characterization of the network load generated by video. Dagiuklas and Ghanbari, in the paper “On the improvement of the quality of service of video services in an asynchronous transfer mode network using forced frame refreshment,” examine how to limit the temporal effect of ATM cell loss through feedback information.

The paper “Comparison of video shot boundary detection techniques” by Boreczky and Rowe studies and compares the algorithms that have been developed for scene change detection in video sequences. Shen and Sethi, in the paper “Scanline algorithms in the JPEG discrete cosine transform compressed domain,” attempt to develop algorithms for processing compressed images that are equivalent to common spatial domain processing without forming the spatial domain image. Finally, the paper “Design and development issues for multimedia information systems” by Day et al. examines software architecture issues for multimedia systems.

In closing, we would like to acknowledge the valuable efforts of all the authors who submitted papers and made it possible to produce this special section. We hope you will find the articles featured in this special section of interest and useful.

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