

Guest Editorial: Cloud-Based Video Processing and Content Sharing

WITH the rapid growth of IPTV and mobile video applications and driven by urgent demands from industry and users, video processing and content sharing technologies have received significant research attention in recent years. Cloud-based video processing and content sharing networks are promising technologies to orchestrate large-scale and efficient video distribution between mobile clients and multimedia cloud systems. The objective of this special issue (SI) is to identify and promote advancements in media cloud-based video processing and content sharing technologies to advance current and enable future anywhere and anytime video processing and streaming applications. It is a great honor of the editorial team to have 12 research groups share their latest research works and solutions to these challenges. The SI attracted a large number of submissions from North America, Europe, Australia, and Asia. Our Guest Editor (GE) team accepted 12 papers that cover multiple aspects of cloud-based video processing and content sharing. We hope that this SI will serve as a good reference for engineers, scientists, researchers, and academics in the field of cloud-based multimedia processing and communications.

In the SI, in the first paper titled as “Towards cost-efficient content placement in media cloud: Modeling and analysis,” the authors present an approach for cloud-centric media network (CCMN) to obtain optimal placement strategy, with lower computational complexity. In the second paper titled as “Resource allocation with video traffic prediction in cloud-based space,” the authors aim to achieve cloud-based system performance by proposing a multi-resolution wavelet-based backpropagation prediction system for the video traffic in the cloud. The third paper titled as “Frame interpolation for cloud-based mobile video streaming” presents a technique that can readily be applied for real-time cloud-based HD video streaming. In the fourth paper titled as “A geometric approach to server selection for interactive video streaming,” the authors develop optimized multi-server selection schemes to improve the quality of service of video transmissions. The fifth paper titled as “In-network view synthesis for interactive multiview video systems” presents a new paradigm to solve the reference view selection problem and capitalize on cloud computing resources to perform fine adaptation close to the clients. In the sixth paper titled as “Delay-optimized video traffic routing in software-defined inter-datacenter networks,” the authors develop a delay-optimized traffic routing scheme that can effectively prioritize and improve

the delay performance of inter-datacenter video flows at a low cost. The seventh paper titled as “Energy-efficient resource allocation optimization for multimedia heterogeneous cloud radio access networks” describes a dynamic network-wide algorithm based on the Lyapunov optimization framework to improve the performance of cloud radio access networks. The eighth paper titled as “DAC-Mobi: data-assisted communications of mobile images with cloud computing support” presents a novel data-assisted communication of mobile image (DAC-Mobi) scheme, which utilizes a large amount of correlated (similar) images stored in the cloud to improve the spectrum efficiency and visual quality. The ninth paper titled as “On data-driven delay estimation for media cloud” presents a data-driven approach that can estimate delay in a practical cloud media with heavy traffic. The tenth paper titled as “Coping with heterogeneous video contributors and viewers in crowdsourced live streaming: A cloud-based approach” presents a cloud-based approach that improves the performance of video streaming in crowdsourced environments. The final two papers address important security and privacy issues for media cloud systems. Among them, the eleventh paper titled as “DPcode: Privacy-preserving frequent visual patterns publication on cloud” presents an approach that achieves high utility while satisfying practical privacy requirement in media cloud systems. The twelfth paper titled as “Time-domain attribute-based access control for cloud-based video content sharing: A cryptographic approach” presents a cryptographic approach to securely share video contents to a certain group of people during a particular time period in cloud-based multimedia systems.

We would like to thank all the authors for their contributions and the reviewers for their great effort in the SI review process. We would especially like to thank the Editor-in-Chief, Prof. C. W. Chen for allowing our GE team to have the opportunity to publish this SI and his great support. We would also like to thank Ms. A. Fisher for her dedication and editorial support for the SI. We believe that the papers from the SI will contribute to the further development of cloud-based multimedia systems and applications and inspire future research in the field.

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