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Special Issue on Computer Graphics And Multimedia Security

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Editorial

Research advances in computer graphics and multimedia security

The rapid advances in computer graphics and multimedia security technologies have heralded a new age of explosive growth in multimedia applications such as real-time 3D game and secure multimedia content. The past decade has witnessed a proliferation of powerful multimedia systems and an increasing demand for practice of computer graphics and multimedia security (CGMS). CGMS has moved into the mainstream of multimedia and has become a key technology in determining future research and development activities in many academic and industrial branches.

This special issue is expected to foster state-of-the-art research in the area of computer graphics and multimedia security (CGMS). This CGMS represents an interdisciplinary field with roots in 2D, 3D graphic processing and multimedia security with application in computing environments including security multimedia content, security in mobile TV, ubiquitous and other applications. It aims to solve the various problems of advanced 2D and 3D processing using computer science and multimedia security.

This special issue is intended to bring together diversity of international researchers, experts and practitioners who are currently working in the area of computer graphics and multimedia security technologies. This special issue is a collection of original papers that cover a wide range of topics from 2D and 3D processing of computer graphics and multimedia security. As a whole, this special issue contains a diverse collection of high-quality papers authored by eminent researchers in the field. There were total 22 submissions from several countries around the world and through a rigorous peer-review process, only 7 submissions got final acceptance for the publication.

The first paper by Wang *et al.* presents curvature-adaptive simplification method for surface preservation in a point-sampled geometry (PSG). Authors consist of focusing on the edge intensities of sample points and the similarity of geometry features of sample points. The strong edge-intensity points in PSG are extracted and residual points are clustered by AMS according to the similarity of geometry features. The paper is showed with apply adaptive mean-shift procedure to segmentation and curve-skeleton extraction of PSG.

The second paper by Juliet *et al.* presents a precise, one-pass block classification method for efficient coding of computer screen images like power-point presentations, webpage and wall papers. When customers need to separate some information of text from main object but compression process losses the quality of text. So, here need high spatial resolution than the picture and background. Mostly computer screen images into text, graphic, picture, background, it sub-bands with each 8×8 blocks. Selwyn, Ebenezer Juliet improved quality of those screen images. Worked with an accurate segmentation algorithm is developed to separate text graphics from pictures and designed a lossless coding method. Here came up the DWT, it based block classification algorithm is higher than others and also it has excellent visual quality of compression.

The third paper by Dejey *et al.* is combined discrete wavelet transform-fan bean transform (DWT-FBT) has been explored as a new possible domain for color image watermarking. Here, the effect of the proposed DWT-FBT image watermarking schemes, presenting WFWC and WFWLC. PSNR of watermarked images is achieved using both WFWC and WFWLC schemes when compared to DWT-DCT approaches. Further, the proposed schemes have a high data embedding capacity in addition to being imperceptible to human vision. It can be blurring, sharpening and histogram equalization, and proposed to develop a blind watermarking scheme with high quality data embedding capacity in future.

The forth paper by Paul *et al.* presents a block-based estimation algorithm based on projection with adaptive window-size selection. Here is used to 1D projection, the original 2D block matching problem is translated to simpler 1D matching problem is majority of potential pixel participation. The goal of this paper is efficient fast-motion estimation method using an intensity gradient algorithm to reduce the encoding time and speed. Here is came with ASR selection scheme, which is both directional projection greatly reduced computational complexity while maintaining prediction integrity since most candidates could be quickly eliminated by having a specific projection as well as a similar search range for correlated consecutive frames. The gradient was reduced and much more amount of computation also reduced by means of the projection method.

The next paper by Lin. proposes a new watermarking method that is robust to RST attacks, blind-detectable and has a reasonable embedding capacity. Authors present how to make advantage of the high RST resilience of

scale-invariant feature transform (SIFT) features. Then, authors discuss how to resist cropping using a human visual system (HVS). Next, the investigation of an HVS-based watermarking strategy that ensures only feature points in the human attentive area are used for watermarking. Finally, variable-length watermark propose spatial-domain and frequency-domain watermarking algorithms show good performance with reasonable watermark capacity and high watermark transparency. This paper also provides acceptable watermarking capacity a computational complexity.

The sixth paper by Jung *et al.* introduce free-form deformation (FFD) based axis aligned bounding box (AABB) to quickly approximate FFD-embedded surfaces for collision handling. They extended the FFD AABB with a more conservative collision handling method between FFD AABBs to deal with the cases that the nodes in one side of FFD AABB are out-of-plane. Traditional FFD method is well suitable for real-time applications that require simulating complex mesh objects, but it does not guarantee the high accuracy of collision resolution. This spatial hashing method can be benefited by parallel computing using multi-cores or GPUs as well.

The seventh paper by Chen *et al.* proposes method for video water marking. It's with the secret image and increasing the security for video, specifically designed for H.264 video. There is need to understand low-pass filter attack and high-pass attack. The proposed system design embedding algorithm provides high-energy and low energy blocks. High-energy block is guard against the noise attack, so one of algorithm designed by high-energy block. Low-energy block is guard against the filter attack. Here is used by the some of the image processing, which is watermark not depending original watermark image. May it can use Gaussian noise, filter and other processing.

Acknowledgments

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