Special Section Guest Editorial: Image and Video Manipulation—Challenges and Solutions

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Information and communication technology is experiencing a steep rise. The amount of digital data present on the internet is unimaginable. Images and videos have become major methods of information exchange, and they form a large chunk of this digital data. There also has been an exponential rise in digital devices that are generating large amounts of multimedia content every day. There are many types of software and apps available to manipulate multimedia content, especially images and videos. Social media harbors platforms where users share their personal data in the form of images and videos. The ease of availability and usage of manipulation software are threats to the privacy of millions of social media users. Such apps can generate fake videos and images realistic enough to fool people. The manipulation of digital content is indeed a threat to individuals and society, but it could prove a disaster for corporations and even nations.

Image and video manipulation is not a new problem, but it is on a constant rise in the last few years. Digital images are frequently tampered with to create forged images, posing a threat to privacy and ownership of the images. Moreover, editing of images and videos, for example, in medical images, may lead to disastrous outcomes. The last five years have seen numerous manipulated videos called deepfakes, realistic looking videos produced by superimposing images of a person on another video, showing the person speaking and doing things that they never did. The realistic videos are generated with the help of deep neural networks or deep learning.

Deep learning plays a crucial role in image and video processing problems. It has been successful in very complex computer vision problems. On the other hand, the immense capabilities of deep learning are used to generate manipulated images and videos. Deepfake algorithms can generate videos and images that are almost impossible for humans to identify as authentic or fake. Face Swap is an easy-to-use open-source platform for creating fake images and videos. Deep autoencoders are used for generating fake videos with Face Swap. The generative adversarial networks provide great results in the image processing domain.

Seeking to show a wide range of perspectives on the topic, 23 papers are included in this special section. The objective of this extraordinary collection of research is to feature the advances from a wide viewpoint on the subjects and also to animate crucial and connected research in the field of image and video challenges. We hope these contributions will be of interest and value to readers from a wide range of subject areas and form a reference for future development. The experience of serving as guest editors for this special section helped us in enriching our knowledge on topics in multiple areas. We want to thank the authors and reviewers for their enthusiastic efforts, and the *Journal of Electronic Imaging* team for its generous and efficient support. In particular, we would like to express our gratitude to the editor in chief for his invaluable support.

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