Journal of Advances in Multimedia

Special Issue on Plenoptic Image Processing
Call for Papers

New multimedia technologies are enabled by the convergence of a number of critical factors including novel and sophisticated image acquisition and processing, greatly increased computational speed and storage capacity, and higher data compression performance coupled with increased transmission bandwidth. The conditions exist for the next multimedia revolution in terms of creating new approaches for the acquisition, processing, and display of new types of images. The ultimate goal is to significantly change the way visual information is captured from real scenes and presented to the human observer. This may include depth-perception visualization without aids (e.g., virtual reality glasses), offering the viewer the capacity to visually “fly-around” an object or a scene, or view a complete sphere of view at multiple points in a natural scene, while preserving photorealistic quality. Achieving this goal will rely on rendering visual information generated by using input images captured from "real" scenes, which is commonly referred to as image-based rendering (IBR).

The idealized concept of the plenoptic function defined in ray space plays a central role in IBR. The parameterization of the plenoptic function describes all the information about the light rays passing through a point in space (e.g., spatial position, intensity, wavelength, time variation).This function can be used as the fundamental concept for designing new image and signal acquisition, processing, and display devices. The plenoptic function can be specialized to generate various mathematical representations of visual information (e.g., light fields, omni-directional images). New configurations of conventional imaging devices, as well as new sensor-optics-mirror combinations can be used to capture plenoptic information, which is typically richer than that produced by standard cameras. This information can be processed in dedicated ways to produce images normally not obtainable with conventional cameras. Thus, the development of new methods for plenoptic image signal processing, including signal acquisition, coding, transmission, and display are of great interest for attaining the goals of IBR.

This special issue will provide an opportunity for researchers in the field to share original work in the area of plenoptic image processing. Submissions presenting mature approaches, as well as early and potentially-disruptive research having a solid theoretical foundation are both encouraged. Topics of interest cover all phases of plenoptic image and signal processing including acquisition, processing, coding, transmission, rendering, and display. Thus, the topics include but are not limited to:

- Spatial and temporal plenoptic sampling
- Light Fields and multiple-view signal processing

- Omni-directional and panoramic signal processing
- Computational photography
- Volumetric methods
- Combining image-based and virtual content for scene rendering
- New plenoptic representations
- Specific error concealment for plenoptic systems
- Mobile plenoptic acquisition and display
- New sensor designs for plenoptic signal acquisition
- New plenoptic display approaches and devices
- Stereo imaging and display

Submission Instructions

Prospective Authors: please submit the PDF of your paper to the Special Issue on "Plenoptic Image Processing" of Advances in Multimedia through the web http://www.hindawi.com/mts/login.aspx?url=%2fmts%2findex.aspx

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Guest Editors:

Dan Lelescu, Micron Technology, email: dlelescu@micron.com.
Dan Schonfeld, University of Illinois at Chicago, email: dans@uic.edu.

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