Light field imaging: challenges and research issues

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Abstract

All imaging systems are about capturing light rays emitted by the imaged 3D scene. While in classical 2D cameras, each sensor element sums light rays emitted by one point of the scene, research effort has been dedicated in the past decade to the design of imaging systems, e.g. rigs of cameras, cameras mounted on a moving gantry, or plenoptic cameras, to record light rays along different viewpoints or emitted by the scene along different orientations.

This talk will review recent progress in light field imaging. It will focus on several challenging processing problems, the representation and compression of the very large volume of captured visual data, the problem of restoration to overcome technological limitations. It will finally present processing problems such as editing, now common with 2D images, which must also be made possible with these –possibly very dense- multi-view captures, if in the future we want a wide deployment of these imaging modalities.

About the speaker

Christine Guillemot holds a PhD degree from ENST (Ecole Nationale Superieure des Telecommunications) Paris. She has been with FRANCE TELECOM, where she has been involved in various projects in the area of coding for TV, HDTV, and multimedia (November 1985 to October 1997) and she worked at Bellcore, NJ, USA, as a visiting scientist (January 1990 to mid 1991). Since November 1997, she is ‘Director of Research’ at INRIA, head of a research team dedicated to the design of algorithms for the image and video processing chain, with a focus on analysis, representation, compression, and editing, including for emerging modalities such as high dynamic range imaging and light fields.


Dr. Guillemot’s research has focused over the past 20 years on numerous aspects of image and video processing: modeling, representation, compression, and communication. Her contributions concern algorithms for image and video analysis, representation, coding, communication and for inverse problems such as super-resolution, inpainting, restoration.