



Light field imaging: challenges and research issues

Dr. Christine Guillemot, IEEE SPS Distinguished Lecturer

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 Supérieure 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 has co-authored 9 book chapters, 65 publications in peer-reviewed international journals (IEEE Transactions on Signal Processing, IEEE Transactions on Image Processing, IEEE Transactions on Information Theory, and IEEE Transactions on Circuits and

Systems for Video Technology), 162 publications in international conferences (IEEE-ICASSP, IEEE-ICIP, IEEE-MMSP, Eusipco) and has co-authored 24 granted patents.

Dr. Guillemot is an IEEE Fellow. She has served as Associate Editor, IEEE Transactions on Image Processing (2000-2003, and 2014-2016); Associate Editor, IEEE Transactions on Circuits and Systems for Video Technology (2004-2006); Associate Editor, IEEE Transactions on Signal Processing (2007-2009); Associate Editor, IEEE Journal on Selected Topics in Signal Processing (2013-2015); Member, IEEE Image and Multidimensional Signal Processing Technical Committee (2001-2006); Member, IEEE Multimedia Signal Processing Technical Committee (2005-2008); Member, IEEE Image, Video, and Multidimensional Signal Processing Technical Committee (2013-Present); Senior Area Editor, IEEE Transactions on Image Processing (2016-2017); Steering Committee Member, IEEE Transactions on Multimedia (2016).

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.



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