

Future of 4D Light Field Display

Takafumi Koike

Faculty of Computer and Information Sciences, Hosei University, Koganei-shi, Tokyo 184-8584, Japan
Tel.: +81+-42-387-7203, E-mail: takafumi@hosei.ac.jp

We describe what is the goal of light field display in the future. 4D Light field display is becoming common 3D display. We think that next 3D display we have to study is a 5D Plenoptic display. As a matter of course, holography is very important 3D display technology we have to develop. However, existing 3D display technology can't display something like an inside of an object, which images depends on depth position of an observer.

Fig. 1 shows a classification of light field display by sampling dimension of light field. 2D light field is a trivial 2D image and it has only sample in position and no sample in direction. 3D light field is classified to two categories. One is 1D integral imaging which has 2D image and 1D direction, another is some kinds of volumetric display to display point clouds data which has only 3D data without any direction. 4D light field is also classified to two categories. One is 4D Light Field display such integral imaging and another is holography. 5D Light Field display is displaying light filed which is known as Plenoptic function [1].

Candidate 5D light field display are a light filed based HMD [2] or a HMD with refocus imaging [3]. Autos tereoscopic 5D light field display will be difficult for a while.

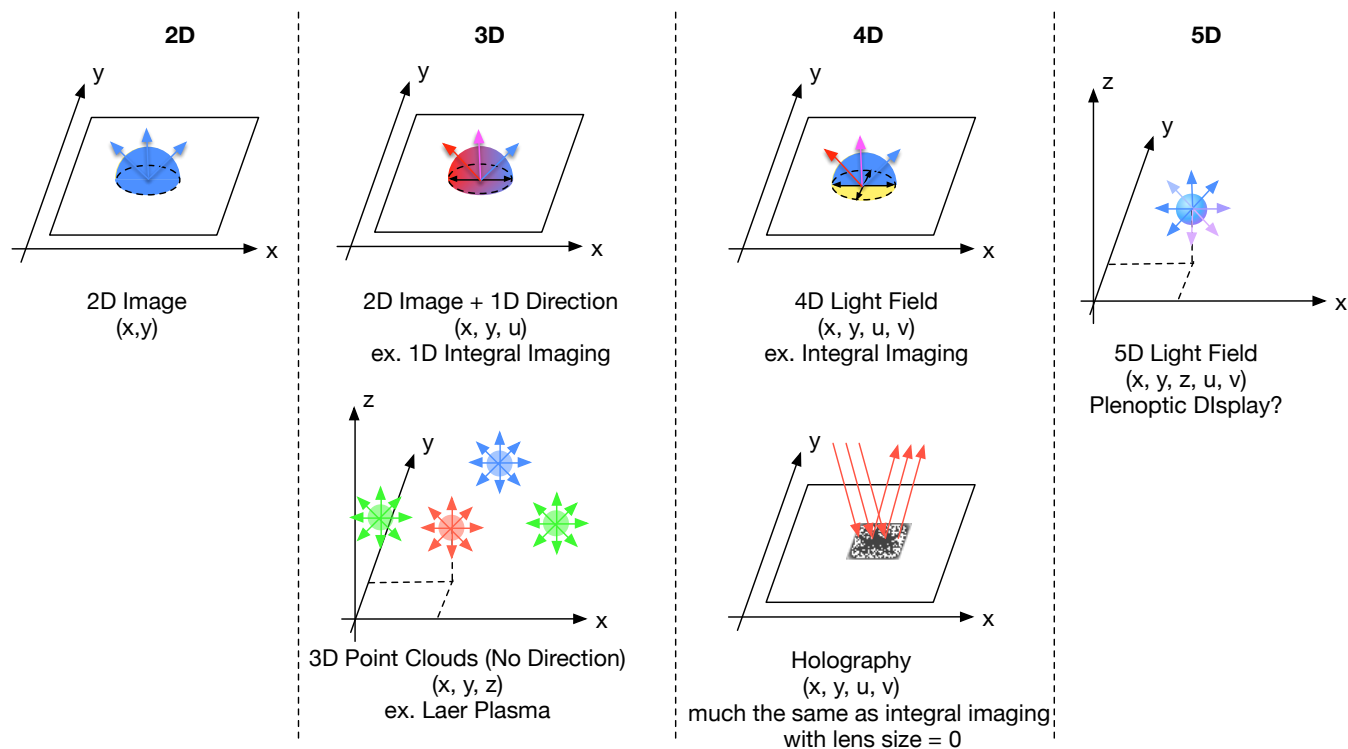


Fig. 1. Classification of light field display by sampling dimension of light field.

Acknowledgment

This work was partially supported by Grant-in-Aid for Research Activity Start-up (13421973) from MEXT, Japan.

References

1. E. Adelson and J. Bergen, *Computational Models of Visual Processing*, pp. 3-20, MIT Press (1991).
2. D. Lanman and D. Luebke, *ACM Transactions on Graphics*, 32(6) (2013).
3. F. Takano and T. Koike, *20th annual conf. of VRSJ* (2015). (In Japanese)