JCT3V-C0210:
3D Holoscopic Video Test Material

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3D VIVANT

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Outline

- Context & Motivation
- Principles of 3D Holoscopic Imaging
- 3D Holoscopic Content Generation and Visualization
- Examples of 3D Holoscopic Video Test Sequences
- Final Remarks

Context & Motivation

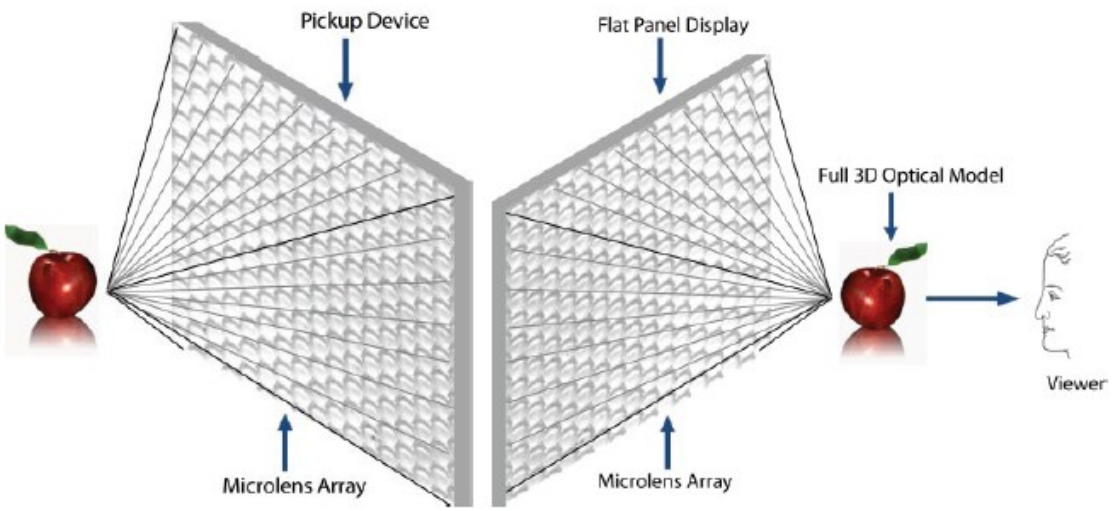
- Researchers seek alternative means for capturing true 3D content for the next generation of more sophisticated depth-illusion technologies
- Holoscopic technology (a.k.a. integral imaging) is a prospective candidate:
  - Consists of a lens array mated to a photographic film or digital sensor with each lens capturing perspective views of the scene
  - EU-FP7 3D VIVANT [1] offers a number of advances in the 3D holoscopic imaging technology for capture, processing, coding and display [2]

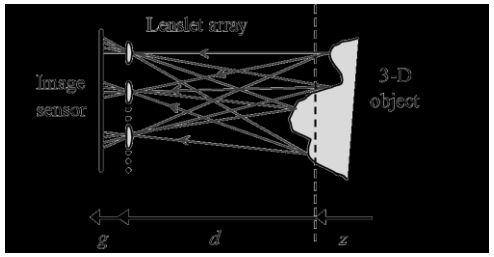
- [1] http://www.3dvivant.eu
- [2] P. Nunes, L. Soares, A. Aggoun, “Recent Developments in 3D Holoscopic Video”, Doc. M25146, MPEG meeting, Geneva, Switzerland, May 2012.

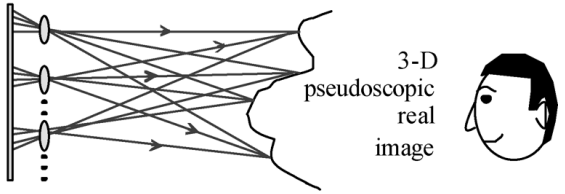
3D Holoscopic Imaging

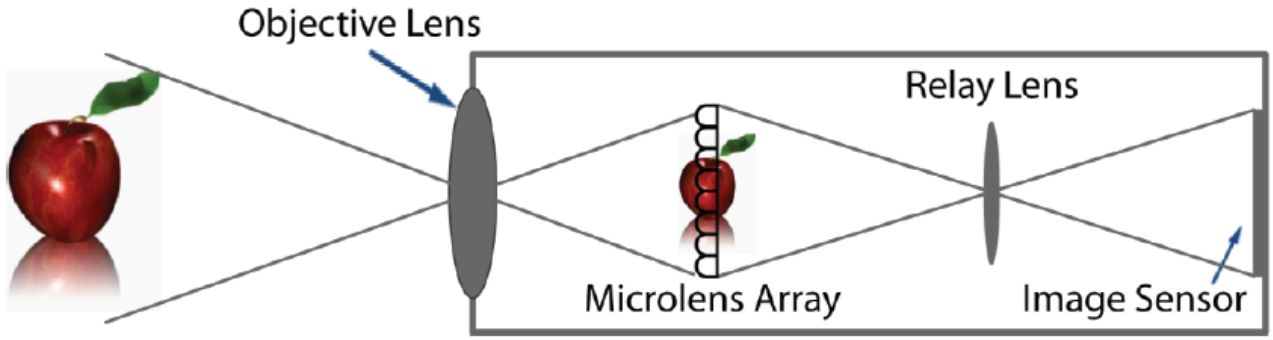
- 3D holoscopic imaging uses the principle of the **“fly’s eye”**
- It duplicates the captured light field and therefore is a **true 3D technique**
- Images can exhibit **continuous parallax** throughout the viewing zone
- **Eliminates some human factors issues** of stereoscopic and multiview systems, such as eye strain and the cardboarding and flipping ffects
- Akin to holography but without requiring coherent illumination => **easy acquisition and display**

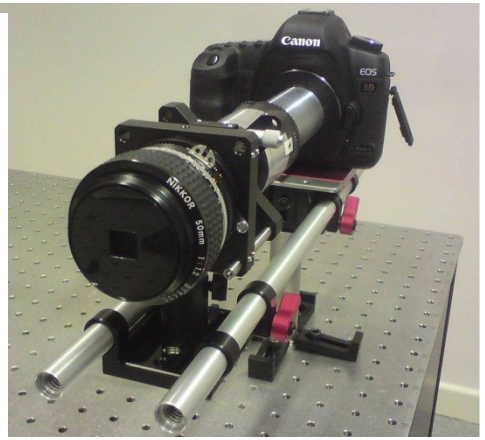
3D Holoscopic Content Generation (I)



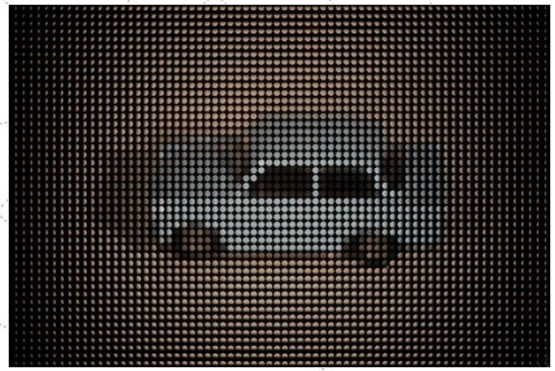


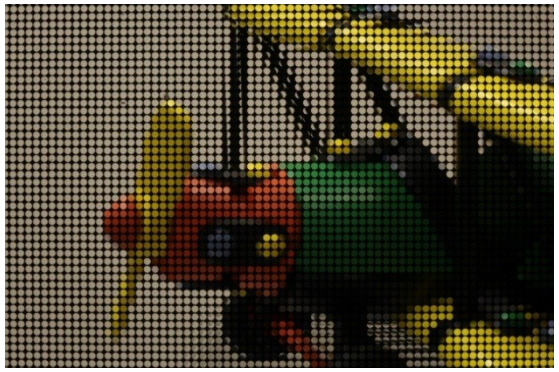


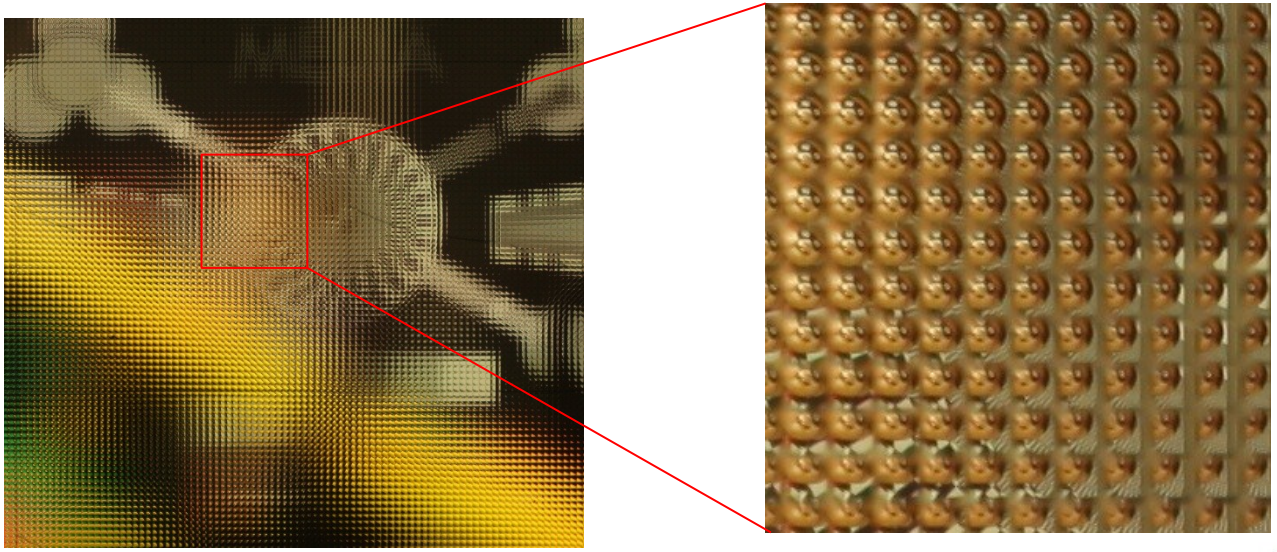




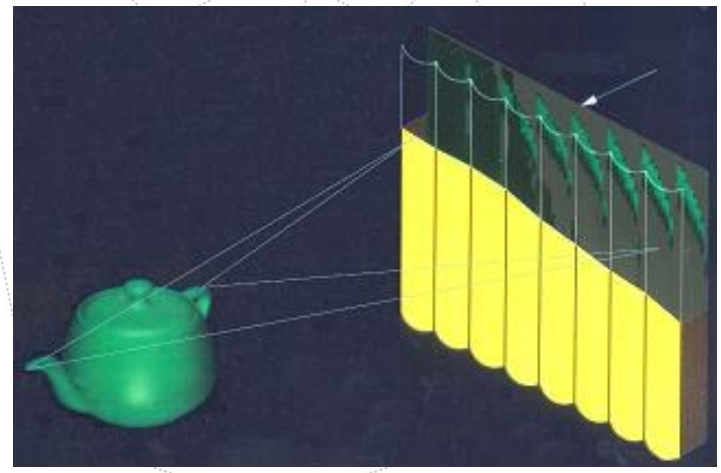
3D Holoscopic Content Generation (II)







3D Holoscopic Content Visualization



- **Unidirectional 3D Holoscopic Content**
  - 2D array of microlenses with a 1D cylindrical microlens array
  - Parallax in the horizontal direction only

- **Full-parallax 3D Holosc**
  - Low-cost display using a pinhole array and a Liqu Cristal (LC) panel
  - Parallax in both the hori and vertical directions

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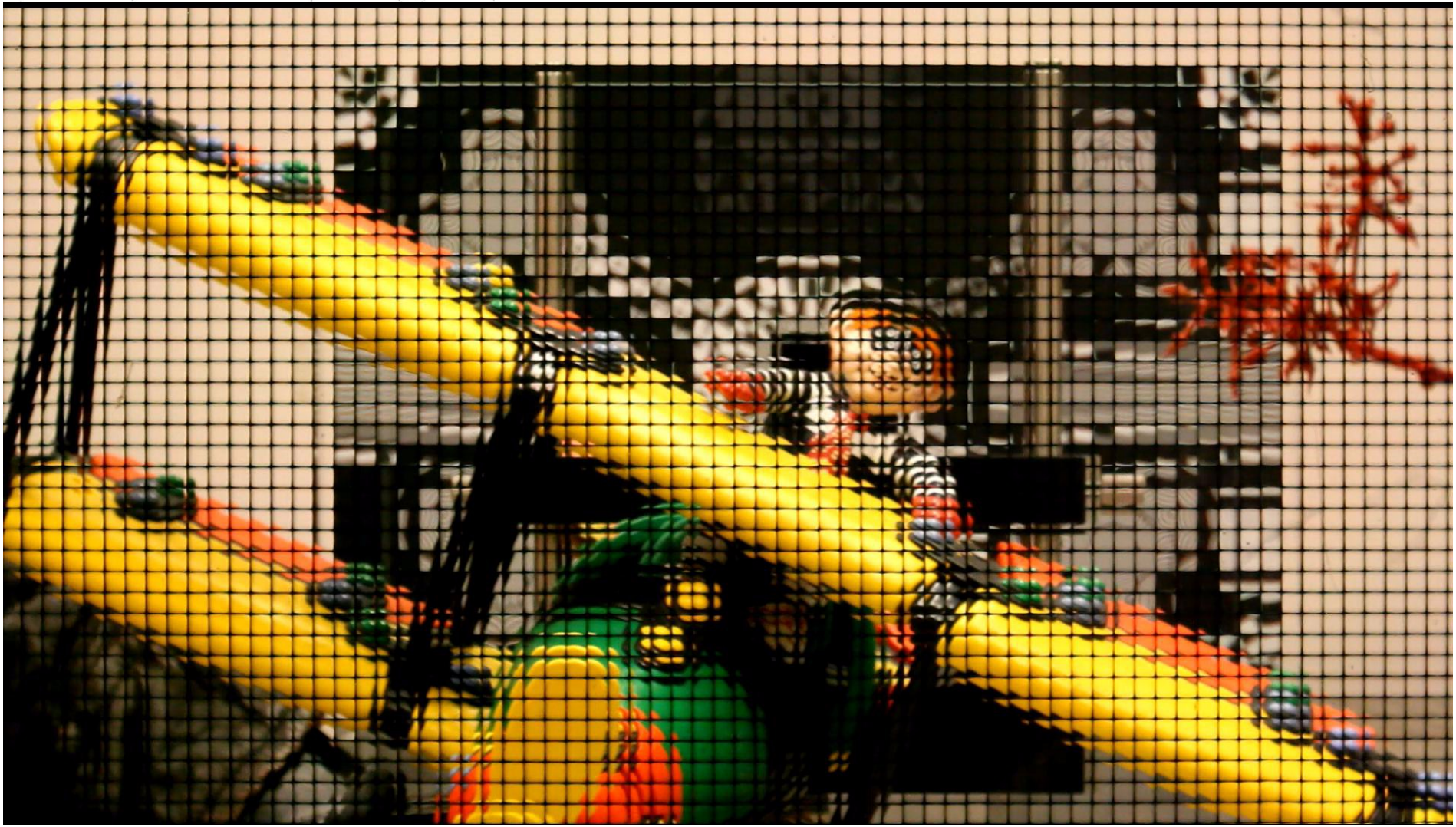
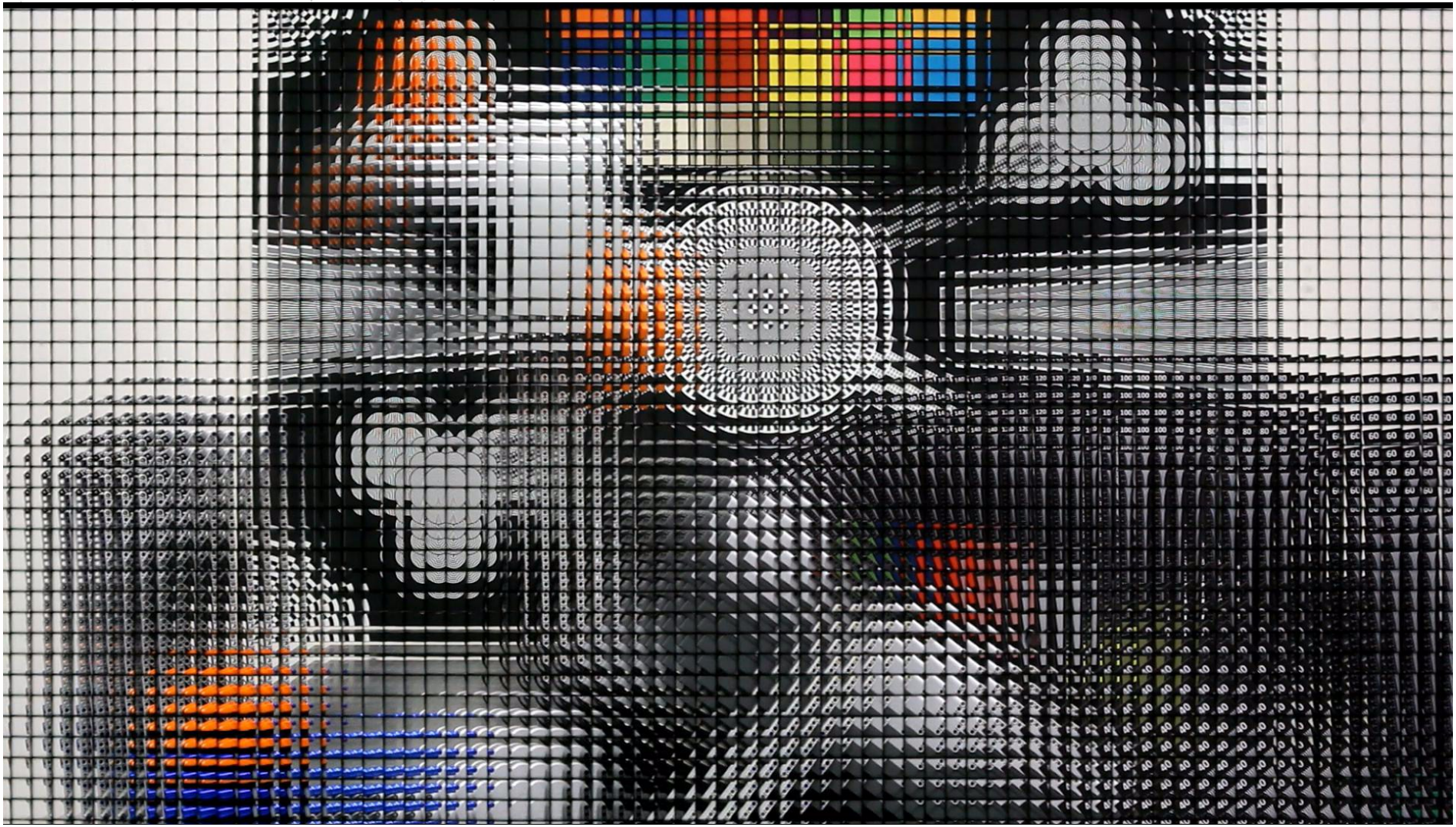
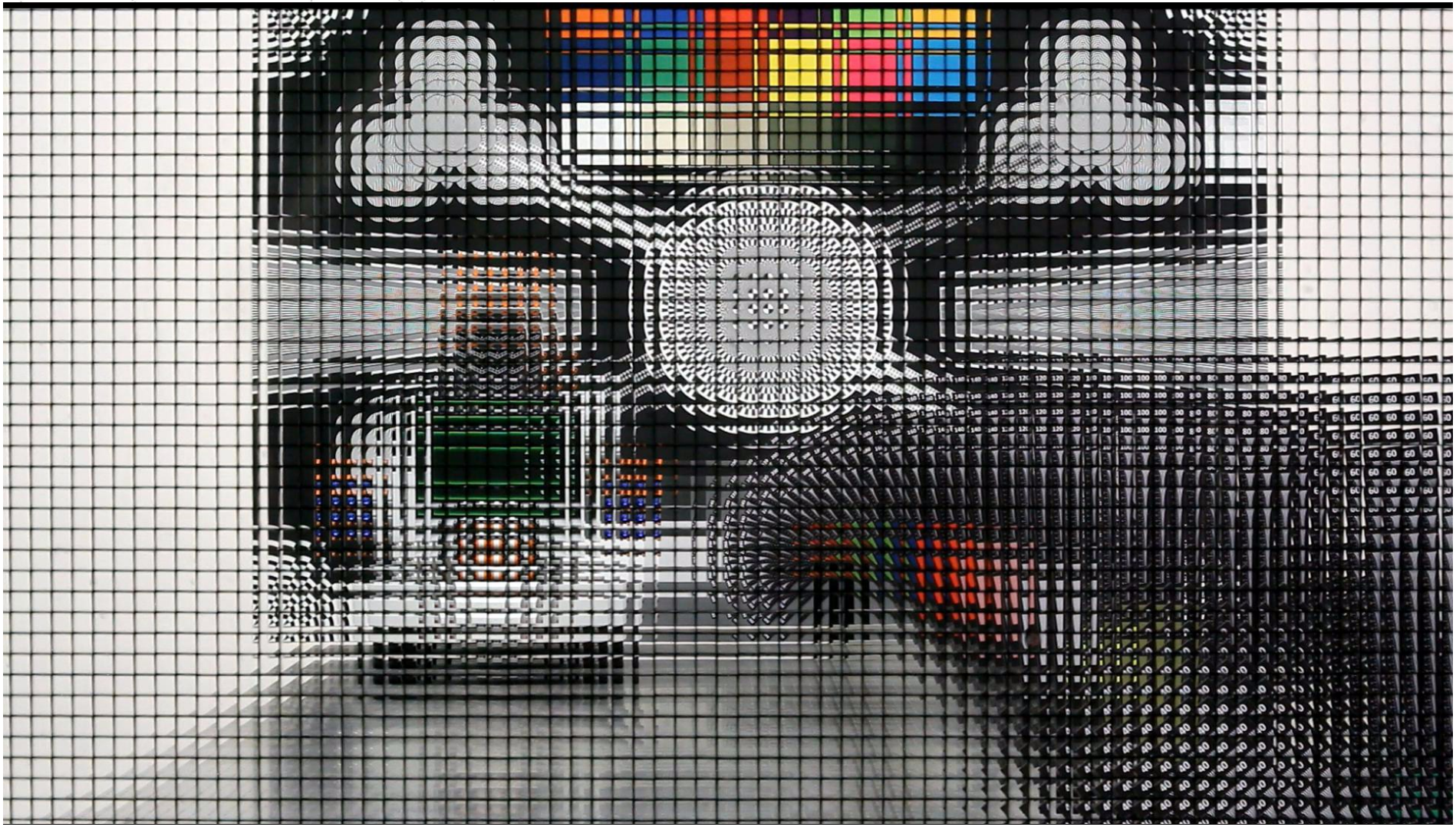
Examples of 3D Holoscopic Video Test Sequences

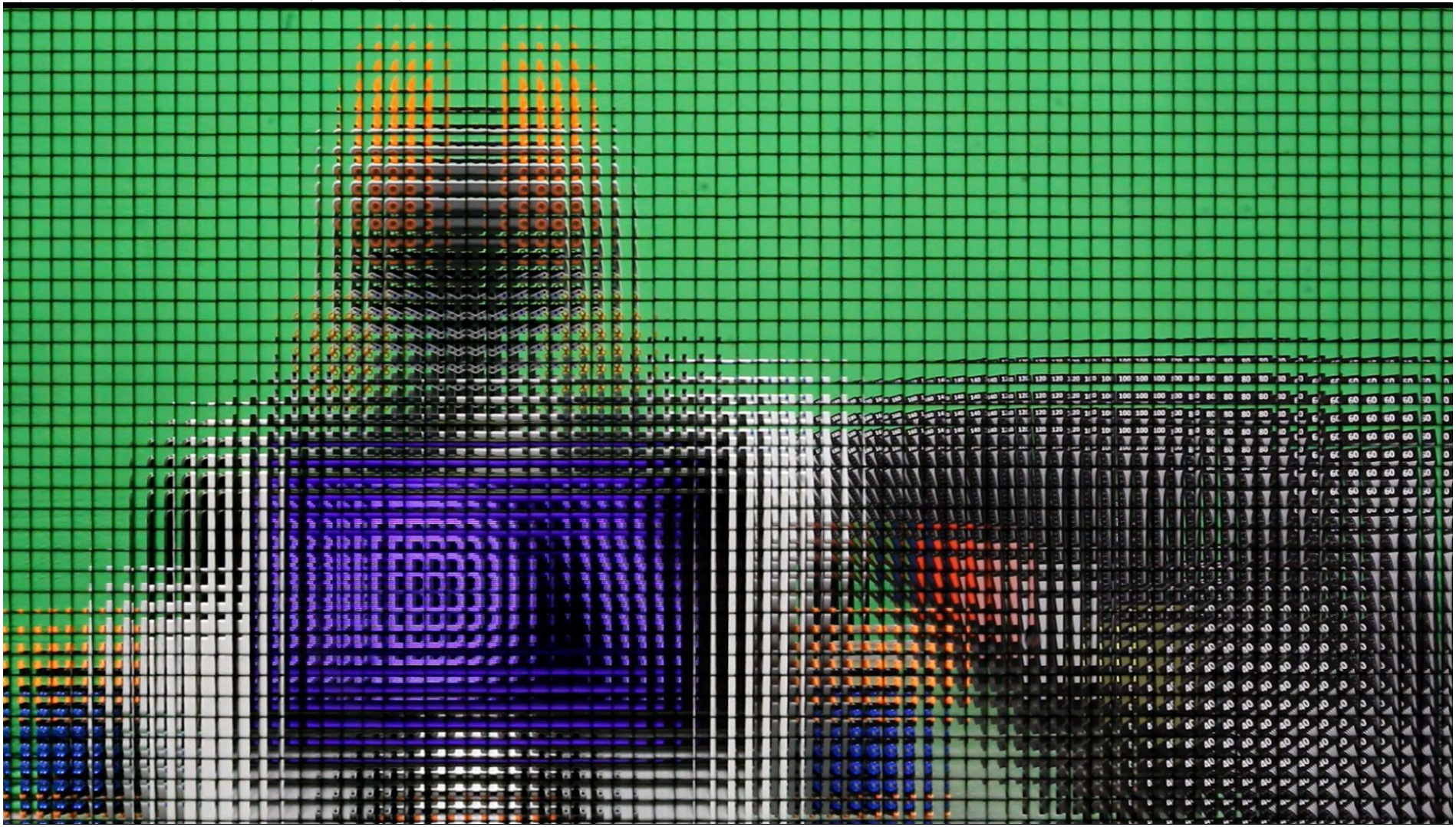
- Microlens arrays
  - 250 μm pitch
  - 90 μm pitch

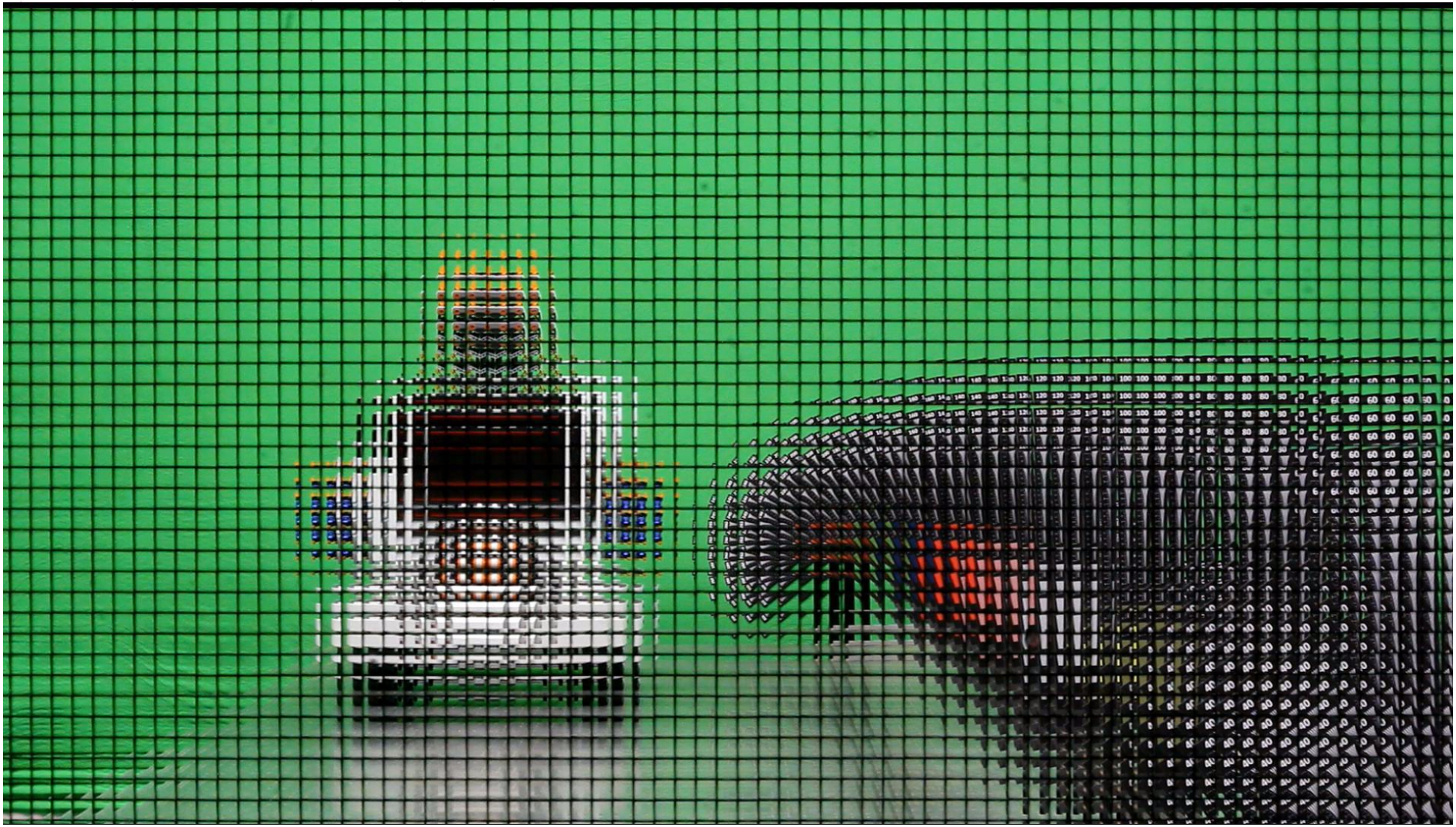
- Spatial resolutions
  - 1920x1080p 25 fps 8 bit/sample
  - 2880x1620p 25fps 12 bit/sample

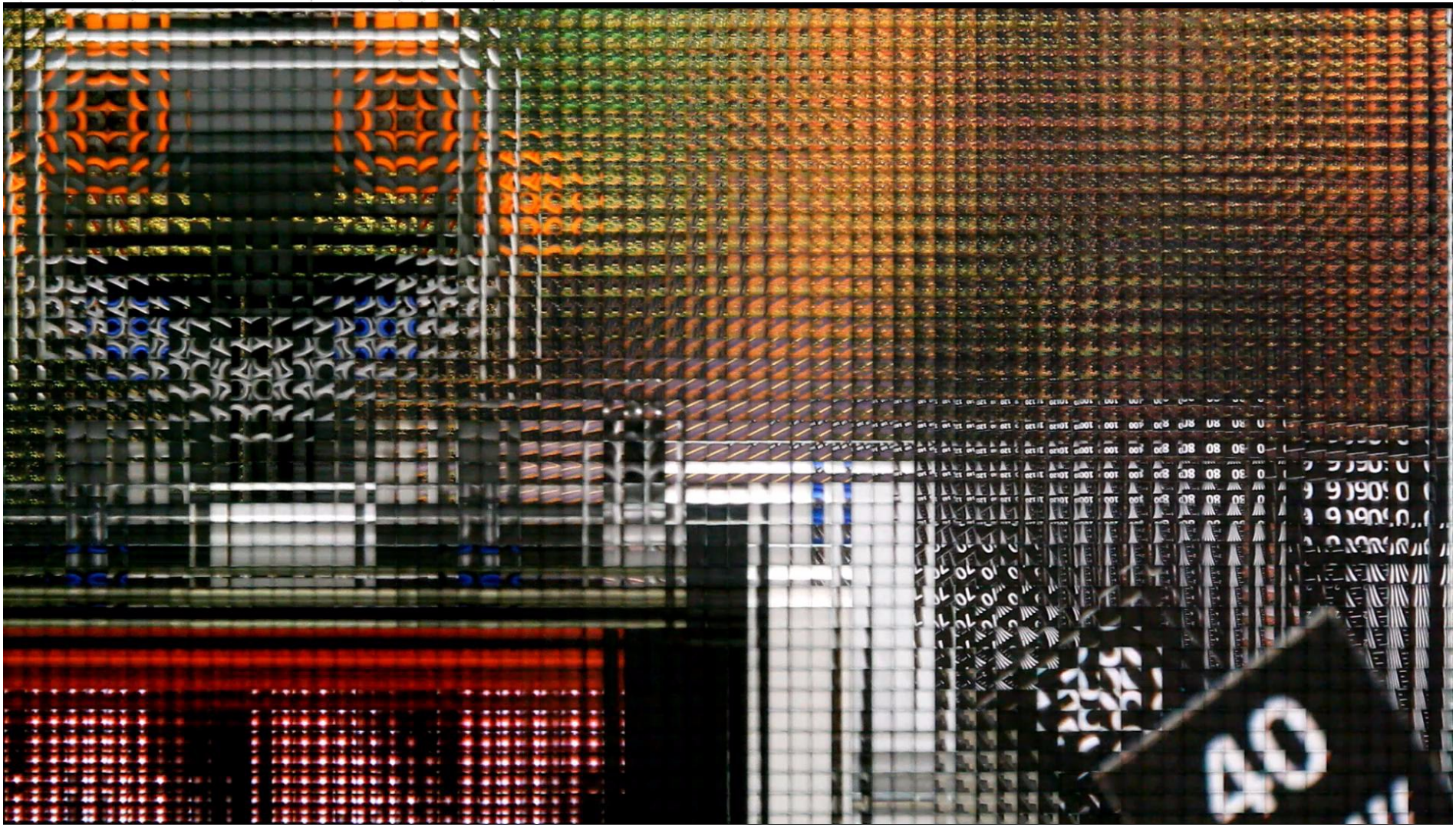












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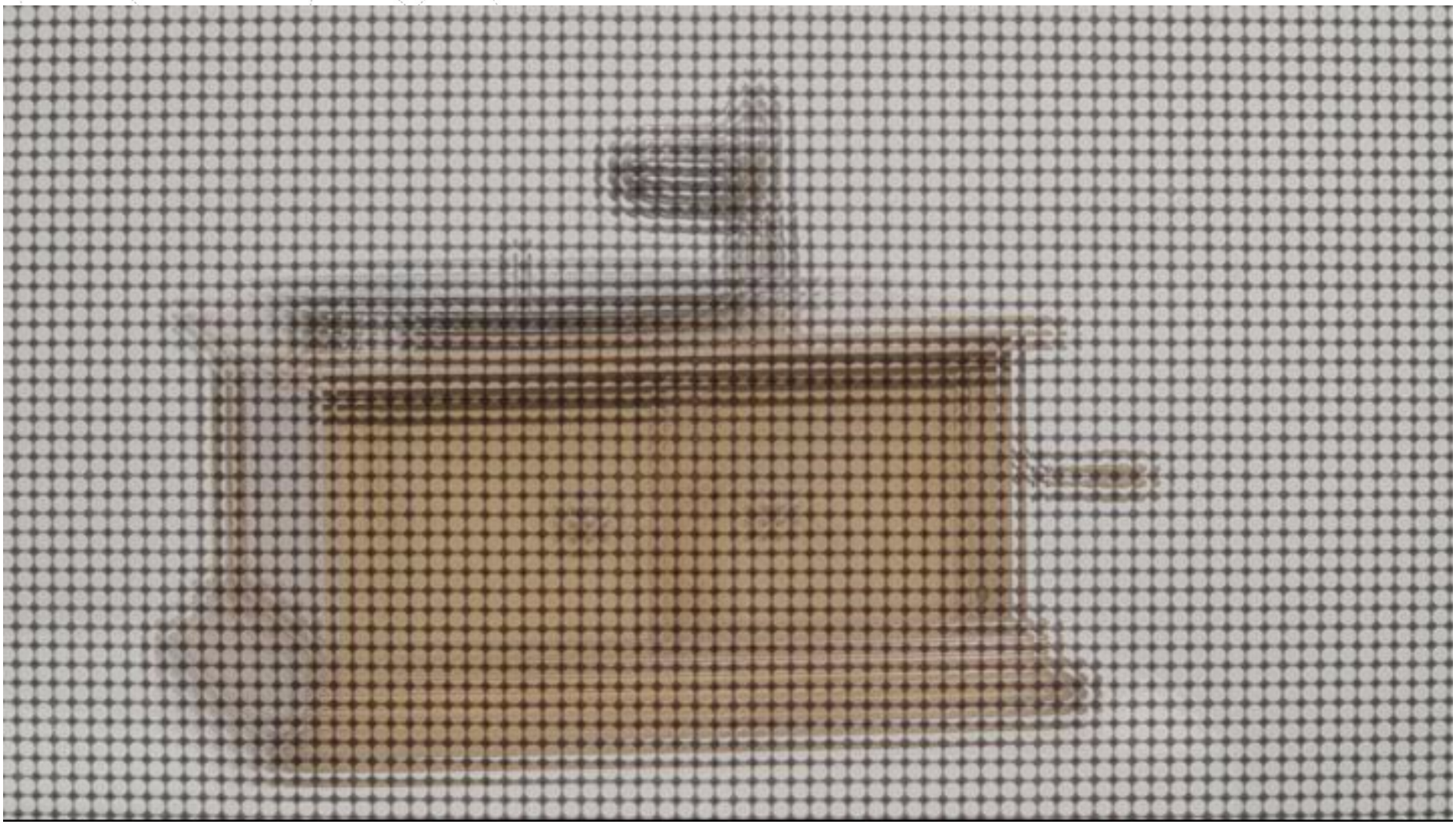

Final Remarks

- 3D holoscopic video is a prospective candidate format for future generation 3DTV systems
- 3D VIVANT has developed flexible optical systems for 3D holoscopic video content acquisition
- 3D VIVANT consortium wants to inform the JCT-3V group that it is willing to providing holoscopic video test material, in order to contribute to the advance of this technology, if enough interest from the JCT-3V group exists