FTV seminar
REI:
A large-screen automultiscopic projection display

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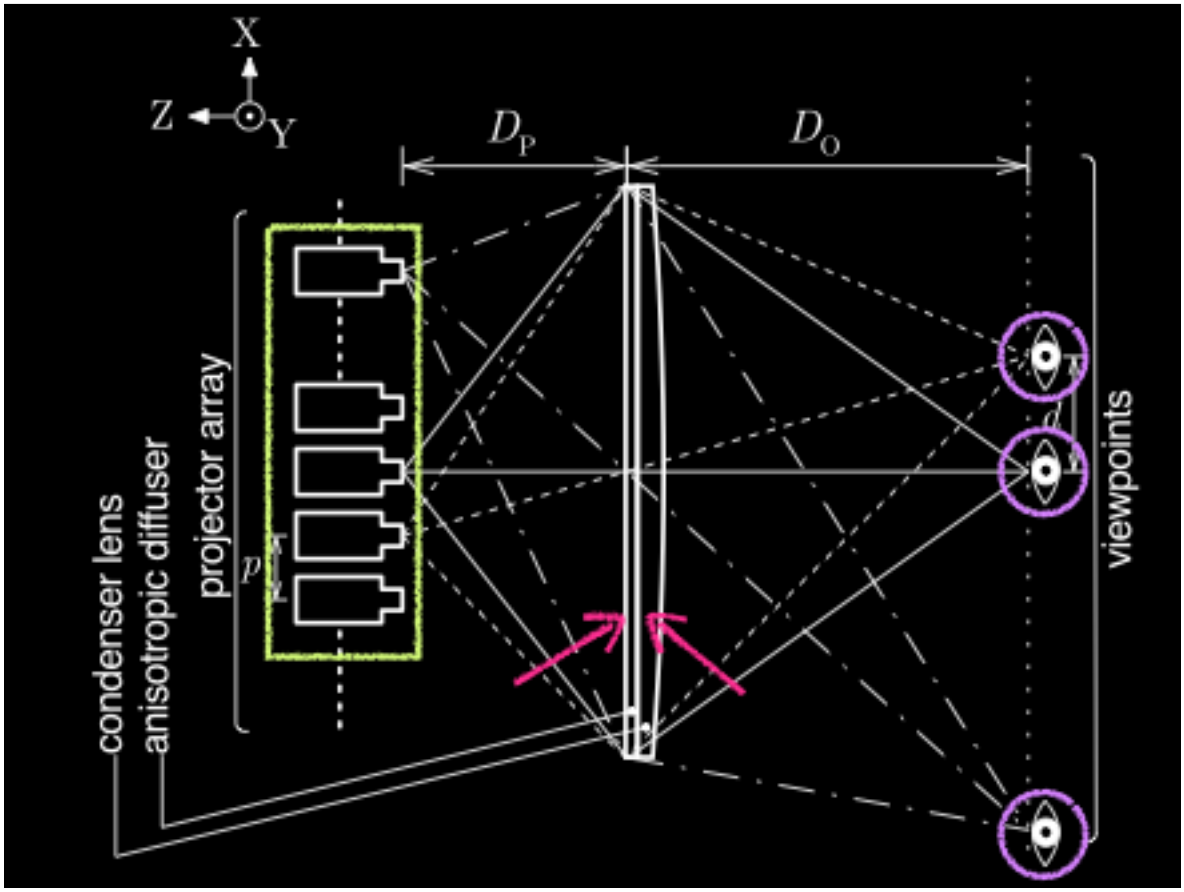
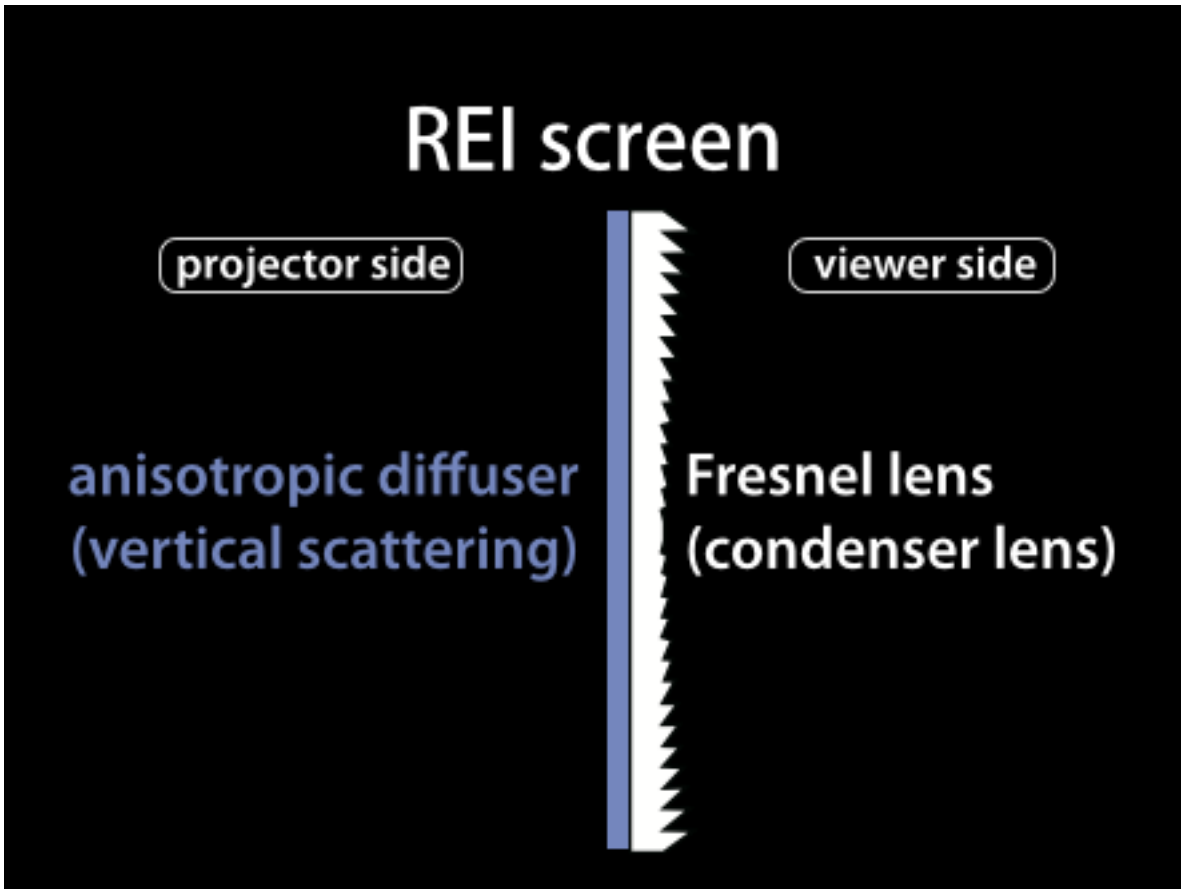
Motives

- Difficulties for multiple viewers support
  - Small screen and limited viewing zone
- Poor image resolution per eye
  - Less than 1/2 HD res on latest 4K flat panel-based auto-stereoscopic display with 9 viewpoints
- Flipping artifact
  - Due to shortage of viewpoints and its density

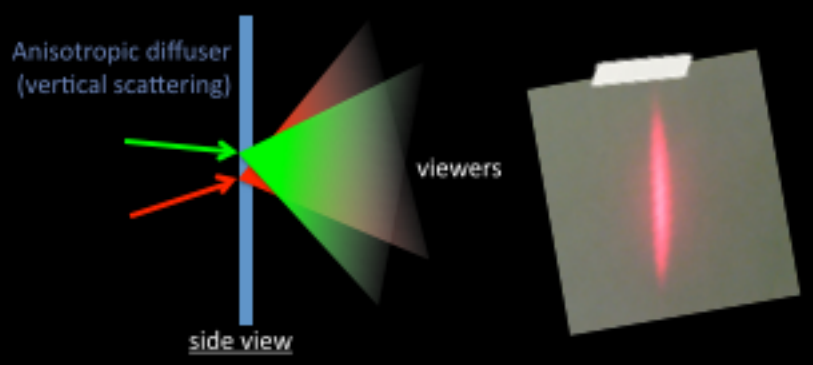
Features

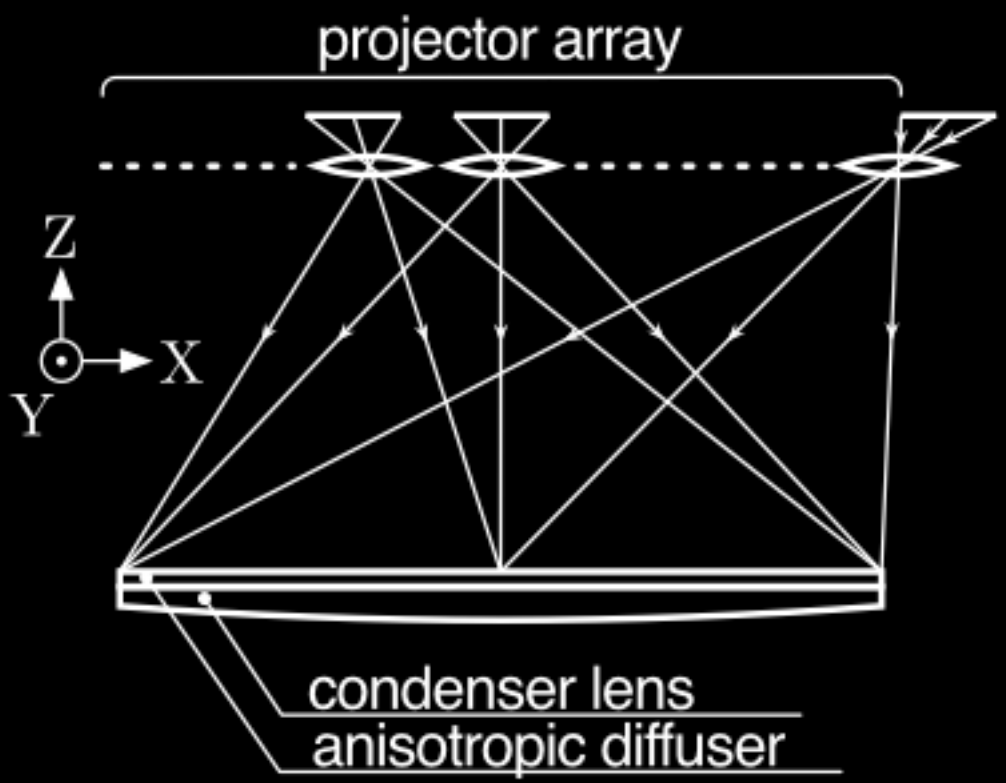
- 3D glasses-free
- Multi-view
  - –Dense and numerous viewpoints
  - –Fluid horizontal parallax
- Big screen – up to 200”
  - –Projection display; rear, multiple and overlaid
- True HD – 1080/60p per viewpoint

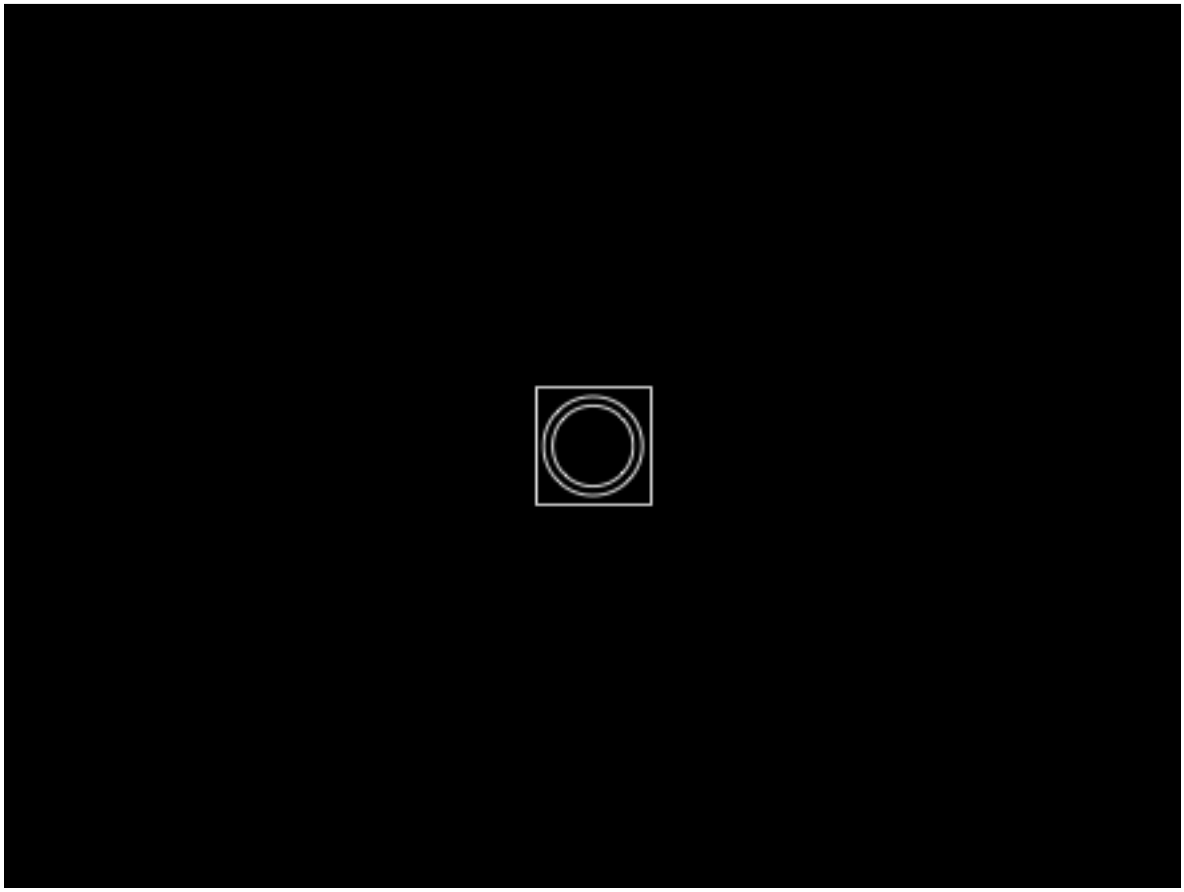

X
Z
Y
D_P
D_O
condenser lens
anisotropic diffuser
projector array
p
viewpoints

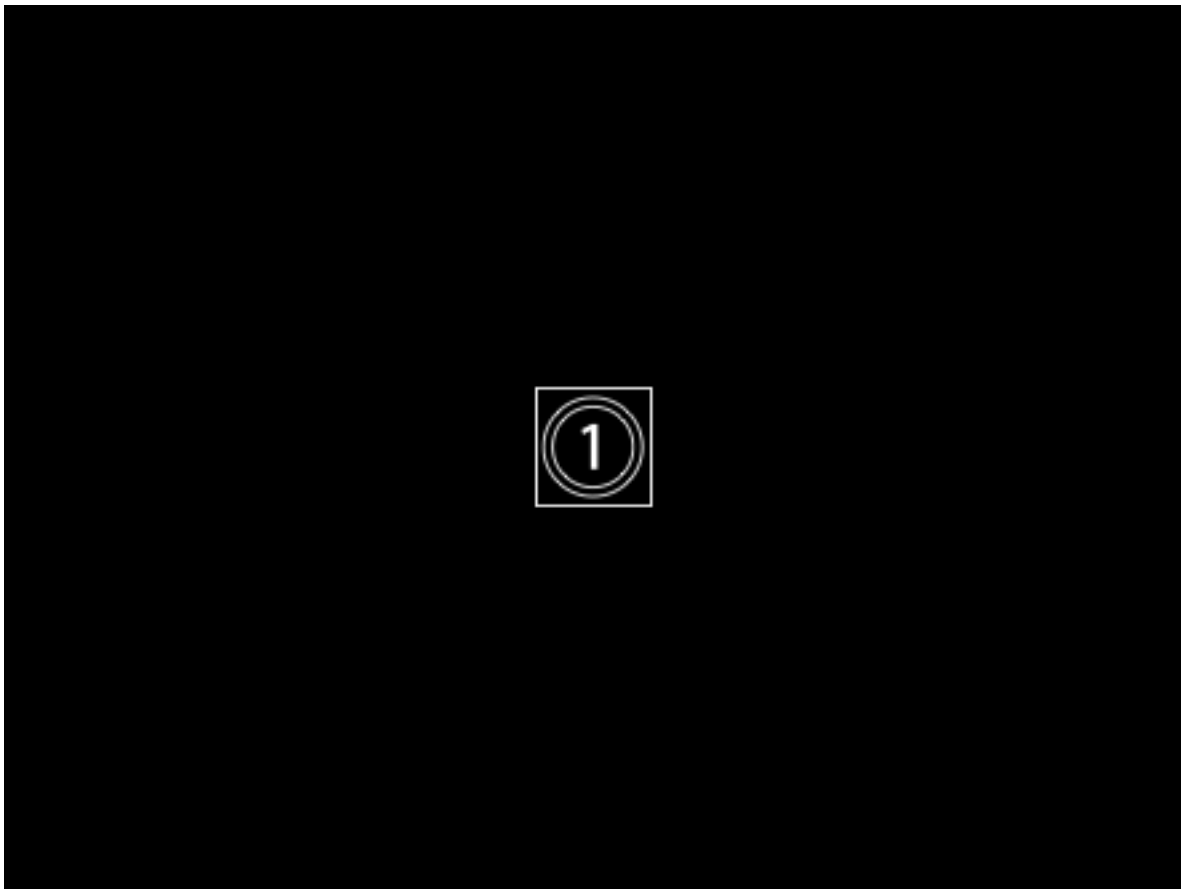

REI screen
projector side
viewer side
anisotropic diffuser
(vertical scattering)
Fresnel lens
(condenser lens)

Anisotropic diffusion



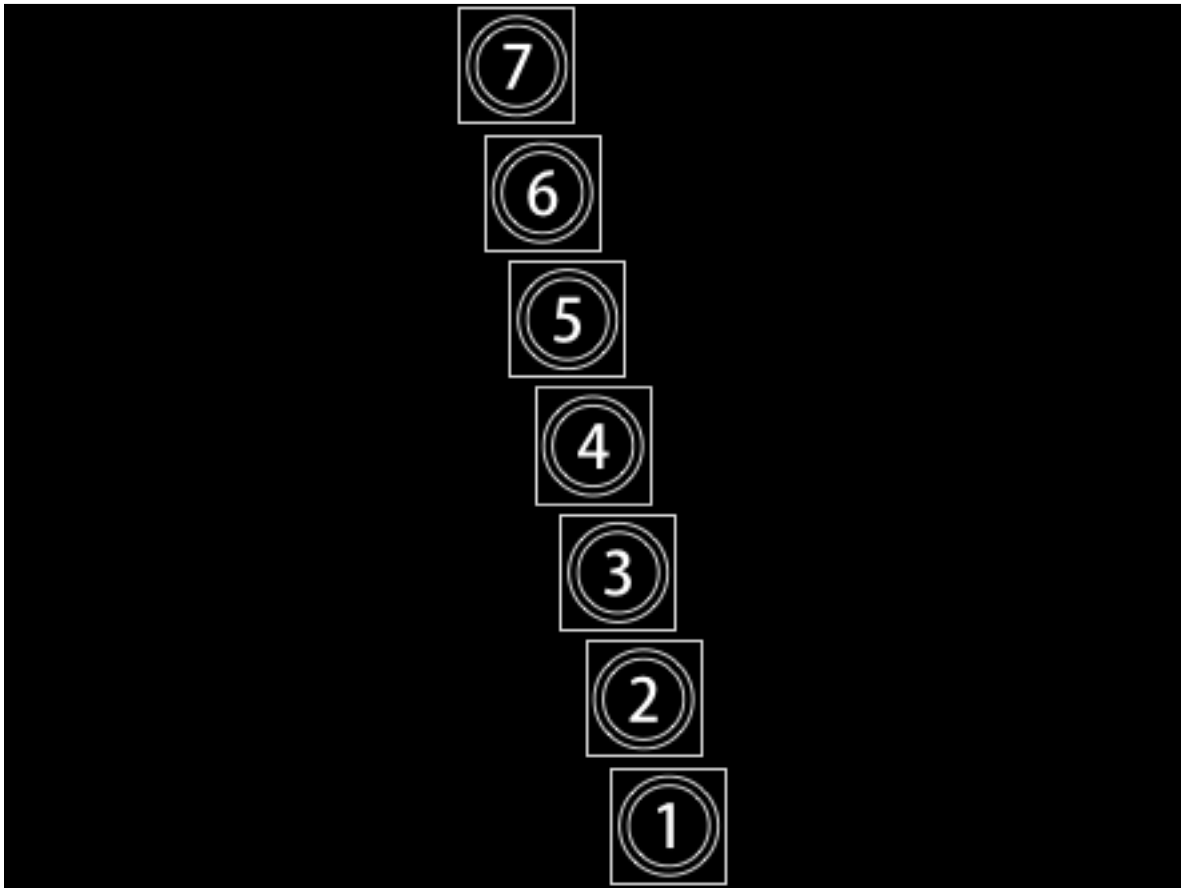





1

7
6
5
4
3
2
1

7654321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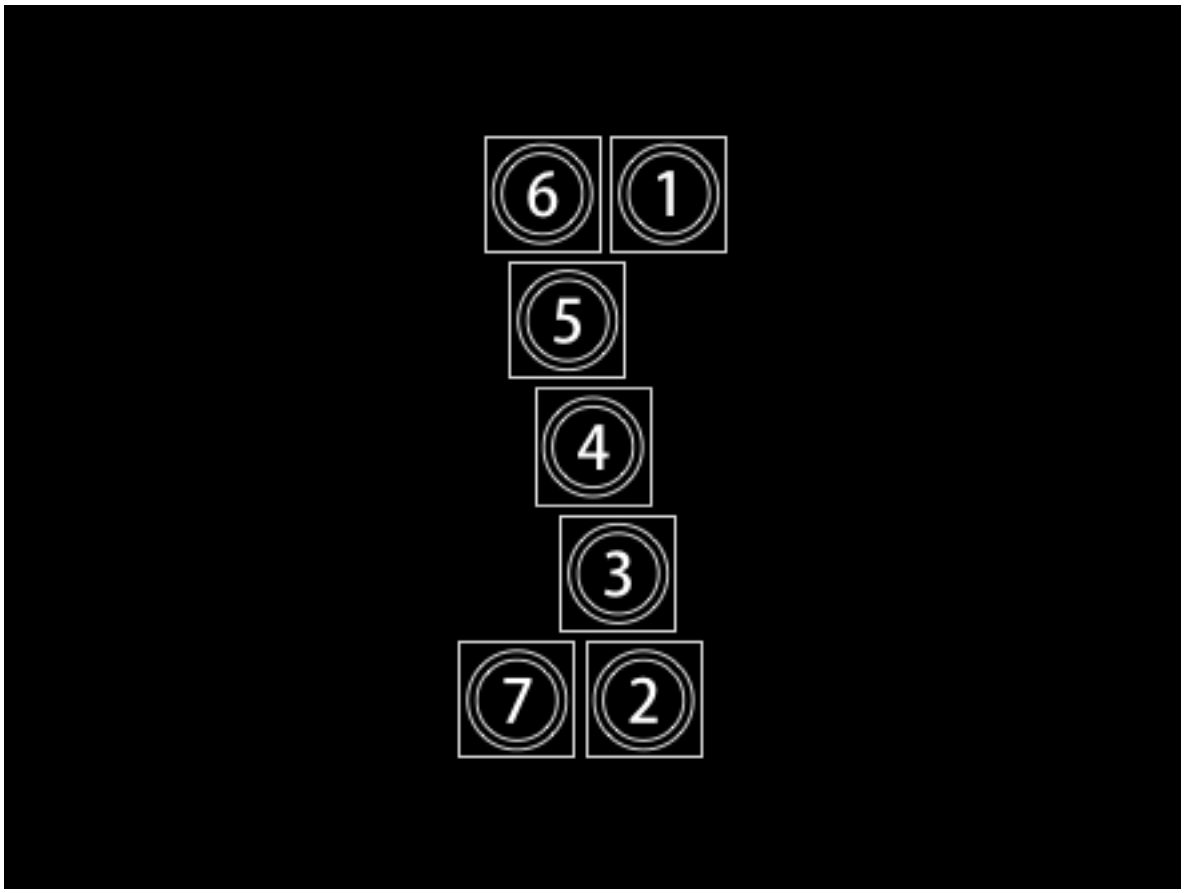
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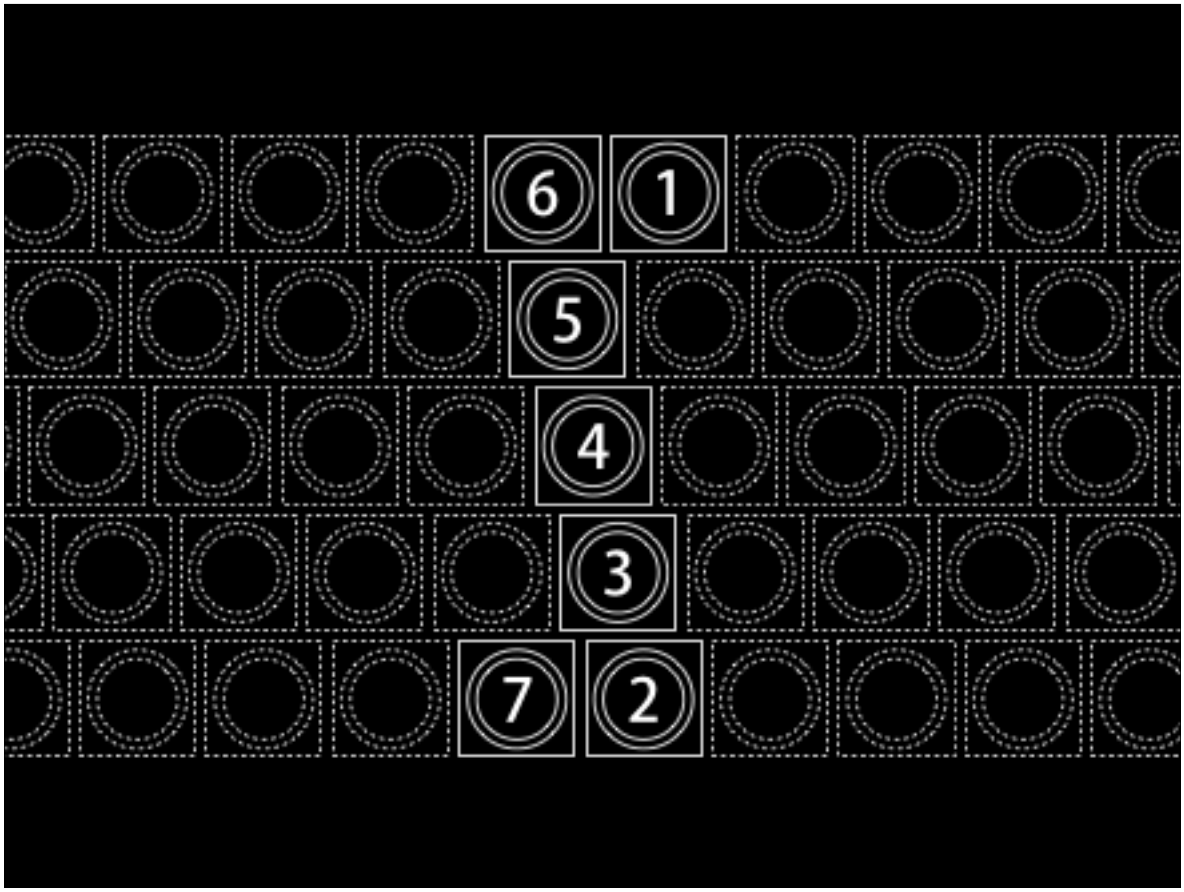
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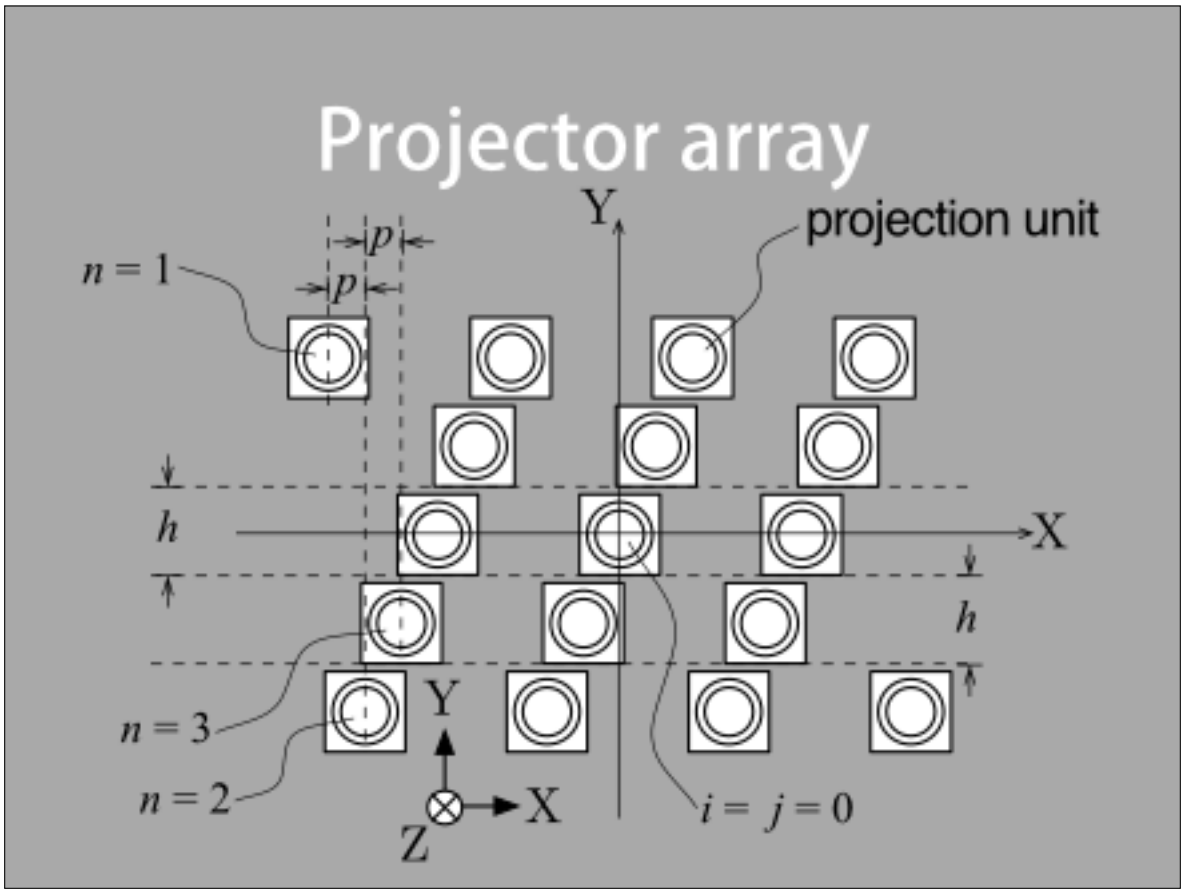
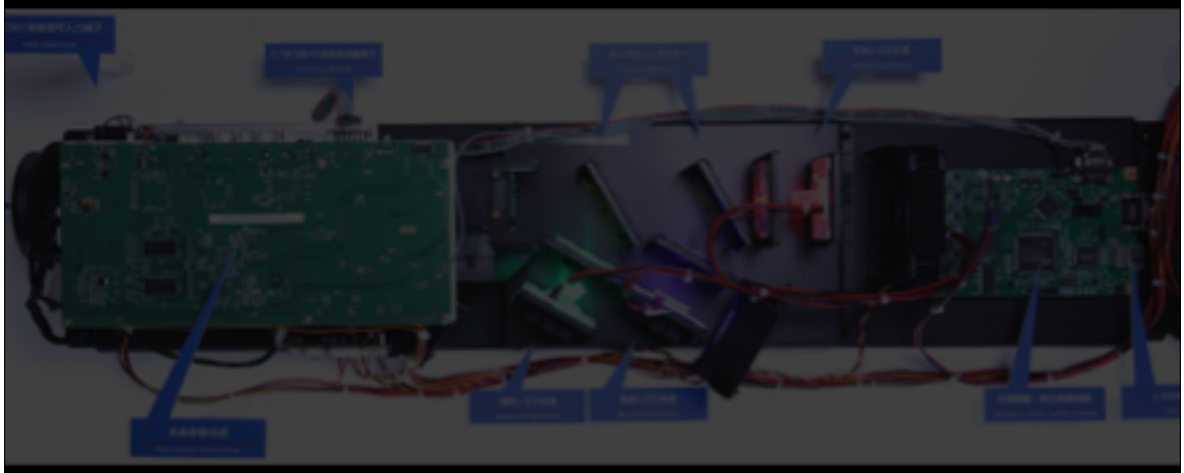

Projector array
Y
projection unit
p
p
n = 1
h
X
h
n = 3
Y
n = 2
X
Z
i = j = 0

Inside Projector array



Projector specification

Device	0.7" LCOS x 3
Resolution	1920 x1080 pixels
Lens	2x motorized zoom / focus f = 21.4-42.8mm / F = 3.2-4.0
Lens shift	80% Vertical, 34% Horizontal (motorized)
Light source	RGB LEDs (19W total)
Input signal	HDMI 1.3
Control	LAN
Power	Up to 150 W
Dimensions	180(W) x 1,300(D) x 180(H) mm

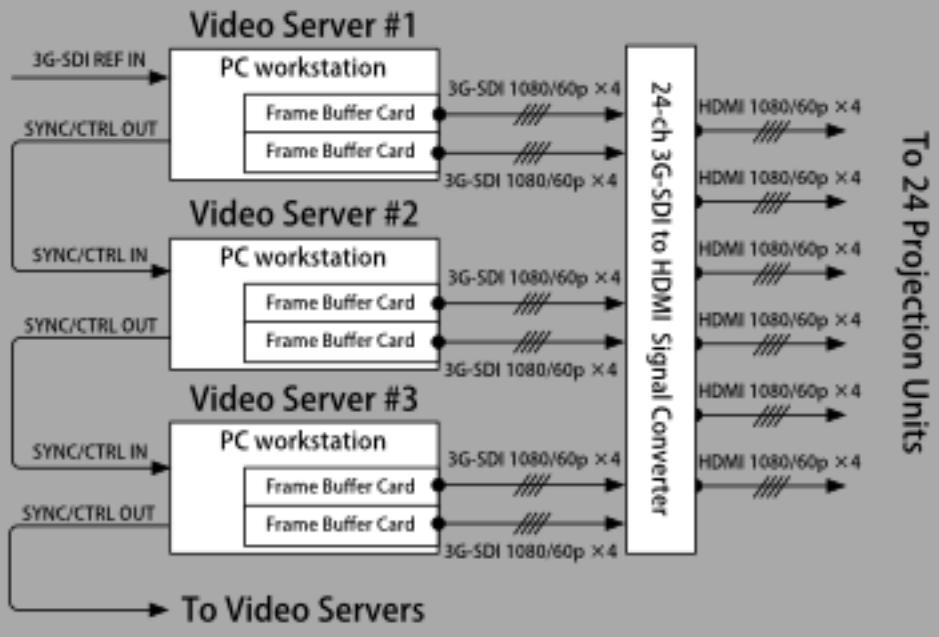
Display specification

Screen size	200"
# of parallax images	170
Projection distance	8,000 mm
Projector pitch	33.0 mm
Viewing distance	5,517 mm
Viewpoint interval	22.8 mm
Viewing zone angle	Up to 40°
viewing zone width @designated distance	4,000 mm

Backend

- Frame buffer memories
  - Uncompressed 1080/60p (4:2:2 10bit)
  - All channel stays in sync
  - 1 projection unit = 1 ch
- A HDMI 1.4a compatible auxiliary input

Backend systems



Results

Public viewing site

- At a multicomplex building in Osaka
  - http://kc-i.jp/en/
- REI proto open hours
  - 11 hours a day (10am - 9pm)
  - 7 day a week

Shooting condition

- Linear arrangement
- Parallel (not convergence) condition
- Asymmetrical view volume (or lens/ filmback shift)

Requirement to FTV

- Wide baseline camera arrangement to support massive viewpoints w/o losing parallax image quality

Conclusion

- High resolution images per viewpoint
- Fluid horizontal motion parallax
- Multiple viewers support