## Index

2D/3D conversion, 29, 61  
3D TV  
4-f system, 87  

### A  

accommodation, 23  
accommodation-vergence mismatch, 31  
active light shutter, 62  
active polarizer, 62  
American National Standards Institute (ANSI), 12  
anaglyph, 21  
aspect ratio, 11  
autorefractometer, 147  
austereoscopic display, 22  
austereoscopy, 19  

### B  

back light, 14  
backlight unit (BLU), 14  
base image, 41, 78, 83  
binocular disparity, 23  
binocular vision, 23  
black matrix, 15, 105, 113  

### C  

calibration pattern, 58, 68, 112  
cathode ray tube (CRT), 8  
central depth plane, 48  
charge-coupled device (CCD), 32, 47  
cold cathode fluorescent lamp (CCFL), 9  
color filters, 15  
compressive light field display (CLFD), 145  
computer-generated hologram (CGH), 33  
concave half-mirror array (CHMA), 36  
cone cells, 4  
contrast, 8  
contrast ratio, 13  
convergence, 23  
cornea, 4  
crosstalk, 28, 105, 113, 116, 118  
crystalline lens, 4  
cycles per degree (cpd), 6  

### D  

depth cues, 23  
depth of focus (DOF), 85  
DepthCube™ volumetric display, 146  
depth-fused display (DFD), 32, 36  
digital light processing (DLP), 9  
directional image, 41  
directional view, 27  
disparity, 48  
distortion, 92  

### E  

electro-holography, 21  
elemental image, 47, 77, 83  

### F  

field of view (FOV), 7  
flat-panel display, 21
flipped image, 54  
focal length, 1  
focused mode, 50  
fovea, 4  
frame rate, 13  

**G**  
Gaussian lens equation, 1, 48  
glasses 3D display, 22  
glasses-free 3D display, 22  
graphics processing unit (GPU), 91  
GRIN lens, 88  

**H**  
hologram, 21, 84  
holographic display, 33  
holographic optical element (HOE), 36, 89  
holography, 21, 22, 32  
horizontal-parallax-only (HPO), 41, 102, 126  

**I**  
illuminance, 8, 12  
indium tin oxide (ITO), 14  
integral imaging, 19, 46  
  angular resolution, 55  
  characteristic equation, 55  
  depth range, 51  
  lateral resolution, 51  
  real mode, 49  
  virtual mode, 49  
integral photography, 19  
interference pattern, 32  
inter-ocular distance, 23, 46  
iris, 4  

**K**  
keystone distortion, 130  

**L**  
laser, 19  
  lens array, 19  
  lens per inch (LPI), 56  
  lens-slanting technique, 101  
  lenticular lens, 19  
  light attenuator, 62  
  light emitting diode (LED), 9  
  light field, 15, 27  
  light field camera, 93  
  linear perspective, 23  
  Lippman, Gabriel, 19, 46  
  liquid crystal, 14  
  liquid crystal display (LCD), 8, 9, 62, 99  
  liquid crystal on silicon (LCoS), 9  
  liquid crystal shutter, 61  
  lens maker’s equation, 1  
  luminance, 12  
  luminous emittance, 12  
  luminous flux, 12  
  luminous intensity, 12  

**M**  
magnification, 2  
marginal depth plane, 54  
  micro-lens array (MLA), 94  
  moiré, 58, 99  
motion parallax, 23  
multi-projection, 127, 130  
  angular resolution, 131  
  floating lens, 127  
  integral-floating-based systems, 127  
  integral-imaging system, 134  
  spatial frequency, 131  
  spatial resolution, 130  
multi-view display, 22  

**N**  
non-negative matrix factorization, 145  
  number of views, 45  

**O**  
OpenGL, 71  
optimal viewing distance, 30, 42, 57
organic light emitting diode (OLED), 9

P
parallax barrier, 19
paraxial approximation, 17
paraxial rays, 1
peripheral viewing zones, 28
Perspecta display, 34
pickup, 46
pinhole array, 29
pinhole camera, 44
pixel, 11
pixel density, 5
pixel mapping, 112
pixel pitch, 5
pixels per inch (ppi), 5
plenoptic camera, 94
polymer-stabilized cholesteric texture (PSCT), 146
projection-optics system, 125
pseudoscopic problem, 87
pseudoscopic-to-orthoscopic conversion (SPOC), 88
pupil, 4

R
Raspberry Pi, 144, 151
ray tracing, 119
real image, 2
response time, 13
retina, 4
RGBW sub-pixel, 116
rod cells, 4

S
shading, 23
slanted lenticular method, 58
Society of Motion Picture and Television Engineers (SMPTE), 7

T
temporal frequency, 8
texture gradient, 23
thin film transistor (TFT), 14
thin lens, 1
Tomlinson Holman’s Experiment (THX), 7
tracking system, 46
transparent 3D display, 36

V
Vermeer, 35
vertical diffuser, 130
view image, 41, 102
view interval, 46
view position, 30
viewing distance, 30
viewing point, 36
viewing region, 36
viewing window, 36
viewing zone, 36, 102, 113
virtual image, 2
virtual reality, 71
visual fatigue, 25, 118
volumetric display, 22, 32
voxels, 22

W
Wheatstone, Charles, 19
Byoungho Lee received his Ph.D. degree from the Department of Electrical Engineering and Computer Science, University of California, Berkeley, California, USA in 1993. He has been in the faculty of the School of Electrical Engineering, Seoul National University since September 1994. He is a Fellow of SPIE, OSA, and IEEE, and a member of the Korean Academy of Science and Technology. He served as a Director-at-Large of OSA and chair of the Holography and Diffractive Optics Technical Group of OSA. Currently, he is on the editorial board of Optics Letters, Light: Science and Applications, and Journal of the Society for Information Display. He has served on the editorial boards of Applied Optics and Japanese Journal of Applied Physics as well as serving as the Editor-in-Chief of the Journal of the Optical Society of Korea. He has received several distinguished awards such as the Scientist of the Month in Korea (September 2009), the Academic Award of the Optical Society of Korea (2006), and the Academic Award of Seoul National University (2013). Currently, he is Vice President of both the Optical Society of Korea and the Korean Information Display Society.

Soon-gi Park is a post-doctoral researcher at Seoul National University. He received his B.S. and M.S. degrees from the Department of Information Display at Kyung Hee University in 2009 and 2011, respectively. He obtained his Ph.D. in Electrical Engineering and Computer Science from Seoul National University in 2015. His research focuses on 3D display systems including various autostereoscopic displays, multi-projection 3D displays, optical imaging systems, holographic printing and holographic optical elements for 3D displays, acquisition and processing of 3D information, and display systems for augmented reality including see-through displays.

Keehoon Hong received his B.S. degree in Electrical and Electronic Engineering from Yonsei University, Seoul, Korea in 2008 and his Ph.D. degree in Electrical Engineering and Computer Science from Seoul National University, Seoul, Korea in 2014. He is currently working as a Senior Researcher with the Realistic Broadcasting Media Research Department of Electronics and Telecommunications Research Institute, Daejeon, Korea. His research interests includes autostereoscopic display, digital holographic display, and holographic optical elements.
Jisoo Hong received his B.S. and M.S. degrees in Electrical Engineering from Seoul National University, Korea in 2002 and 2004, respectively. From 2004 to 2008 he was a senior research engineer with LG Electronics, Korea. In August 2012, he received his Ph.D. degree from his alma mater. In 2013, he was a postdoctoral researcher in the Department of Physics at University of South Florida, Tampa, Florida. Presently, he is a senior researcher with KETI (Korea Electronics Technology Institute). He is interested in 3D display techniques ranging from light field to holographic representation and incoherent digital holography for biomedical imaging and 3D photography.