

Index

a

analytical tools 307
 ACES methodology 306–308
 acousto-optics modulator (AOM) 43
 active measurement 335–336
 active stabilization 378–379, 390
 active tiling system 59
 adjusting beam 420–421
 aliasing effect 70
 aliasing images 64, 70
 amplitude modulation 6, 9
 analog drive scheme 6
 analogy 170, 249, 251
 analysis complex-valued 10–11, 153, 156, 164, 191
 angular perspective 76
 angular spectrum 43, 148, 168, 250, 275, 332, 336, 340
 a-priori knowledge 266, 288, 293, 306, 331, 335–336
 area related resolution 333, 337–338
 assistance system 335, 338–339, 355
 Association of University Technology Managers (AUTM) 222
 asymmetrical diffuser 76, 81, 88
 atmosphere 369–370, 373–374
 atmosphere isolation 377–378
 autostereoscopic displays 31, 33, 36–40, 91, 97

b

back projected reference beam 421
 background illumination 100, 374–375
 bacterial cells 189
 bandlimited 333
 bandwidth spatio-temporal 58, 183
 Bayh-Dole Act 1980 217
 beam, 10, 16, 40, 43–44, 58, 60, 67, 70, 76

beam hardening 225, 233–236
 Bessel beams 195
 bit depth 5, 7, 62
 bottom-up strategy 335
 bumps 360, 394
 business 207–208, 210–212, 214–217, 219, 221–222

c

calibration devices 357–359
 calibration procedure 88, 260
 cantilever 314, 316–317
 cantilever microcontact 319–322
 carrier frequency 66–67, 248
 cavities 191, 228–229, 394–395
 charge-coupled device (CCD) 12, 14, 16, 60–62, 72–75, 80–81, 84–86, 123, 126–127, 130–131, 137, 148, 152–154, 157, 164, 166, 169, 172, 174, 196, 244–248, 265, 276–277, 288, 290, 309–310, 312, 351–352, 354, 397, 400, 402–403, 423–430
 claim 219–220
 coherence 42, 73, 76, 96, 101–102, 225, 256, 274
 coherence holography 16, 239–252
 Coherence Scanning Interferometry (CSI) 283, 294–296, 298
 coherent 17, 40, 42, 95–96, 121–122, 135, 142, 146, 150, 164, 241–242, 248, 274, 295, 418
 colloidal sciences 179, 181, 187–188
 color reconstruction 59, 122, 126–127, 130
 comparative deformation measurement 419
 comparison measurements 257, 260, 268–271
 complex-valued data 63
 complex-valued modulation 10–11
 compression lossless 62–63, 77

- compression lossy
 - computational integral imaging
 - reconstruction (CIIR) 45–46
 - computational tools 308
 - compute unified device architecture (CUDA) 43
 - computed tomography 123, 225–237, 393
 - computer generated holograms 13, 43, 58–60, 80, 83, 96, 121, 179, 183, 239
 - computer-aided accuracy 233
 - confocal microscopy 225, 259–260, 339, 360
 - conjugate reference beam 419
 - contrast ratio 9
 - 2D/3D conversion 47
 - copyright 208–210
 - cracks 359–360, 394–395, 400, 403
 - critical dimension (CD) 263, 298, 327, 340, 343
 - cross-modulation 11
 - cross-talk 33
 - crystalline structures 188
 - curvature of the microdisplay 4
 - cutoff frequency 142–144, 333
- d**
- dark-beam scanning 340
 - dark-field illumination 279, 340
 - data capture 58–59, 334
 - data compression 62, 75
 - data decompression 62–63, 77
 - data processing 40, 62, 335, 339
 - deconvolution 334
 - decoupling of capture and display systems 63
 - defectoscopy 327
 - defects (Materials) 393–400, 402–404, 406
 - 3D deformation field 432
 - delamination 227, 359–360, 401–403, 414
 - dents 394
 - depth cue 47, 57, 96
 - depth of focus 89–90, 163–166, 225, 327, 333
 - depthcube 40, 42
 - depth-fused display (DFD) 34, 44
 - 3D depth information 45
 - depth-of-field 163, 172, 222
 - design Patent 208–209
 - dichromate gelatin 103–104
 - difference holographic interferometry (DHI) 418–423
 - differential interference contrast (DIC) 15
 - diffraction 10–12, 16, 43, 58–59, 61, 64, 66, 77–78, 95, 97–115, 122, 124, 128, 164–165, 168, 172–173, 180, 183–184, 193, 195, 225, 241, 245, 255–256, 262, 264–265, 268, 327, 331–333, 337, 341, 343–344, 347–348, 352, 384, 428
 - diffraction limited lateral resolution 327, 331–333
 - diffractive lens 149–150, 152, 156, 193
 - diffractive optical elements 99, 183–184
 - digital (many entries)
 - digital drive scheme 6–7
 - digital holograms in-line 95, 229
 - digital holograms reconstruction 11, 13, 19, 21–22, 45, 59–62, 64–70, 76, 80, 82–89, 90, 97–101, 104, 137, 140, 143–148, 150, 156, 164–172, 231, 240–244, 246–247, 290, 431–432
 - digital holograms recording 42–43, 57–58, 60, 88, 95–96, 99–102, 104–109, 111–115, 135–136, 150–151, 158, 160, 164, 240, 247, 418–421, 428–429, 431
 - digital holographic display 115–116,
 - digital holographic interferometry 383
 - digital holographic microscope 386–387
 - digital holography 11–12, 20, 59–60, 63, 115, 122, 135–159, 164, 168, 290, 340, 384, 386, 390, 413–433
 - Digital Micromirror Devices (DMD) 59
 - Digital Speckle Shearography 402–403
 - dipole approximation 180
 - direct and indirect solution strategies 305–322
 - direct problem 329, 331–332, 336
 - direct strategy 305–322
 - disclosure 208, 221–222
 - 3D display techniques, recent 32, 44
 - display with plane beam illumination 79
 - display 3D 19–20, 22, 31–48, 58, 115, 122, 350, 357
 - display autostereoscopic 31–33, 36–40, 97
 - display holographic 21, 31, 34, 40, 42–44, 58–59, 62–69, 77–85, 95, 105, 108, 115–116
 - display holography 95–116
 - display stereoscopic 31–36, 40, 47–48, 57
 - display with circular configuration (geometry) 67–68
 - display with divergent (spherical) beam illumination 67, 79, 147
 - display with planar configuration (geometry) 66
 - display-independent processing 63
 - display-specific processing 63
 - double-exposure method 311
 - Digital Speckle Pattern Interferometry (DSPI) 369, 372, 382–384, 390, 414, 432

dual-axes accelerometer 314, 316
 dual-use application 328
 dynamic optical tweezers 181–183

e

effective medium approximation
 (EMA) 345
 electrically controlled birefringence
 (ECB) 1
 Electro-Holography 43, 59–60
 Electronic Speckle Pattern Interferometer
 (ESPI) 382, 384–385, 390
 ellipsometry 289, 291–292, 294–295, 299,
 343–348
 elliptical geometries 193
 elongated object/non-spherical object 189
 emerging technology (ET) 312
 end-to-end 3D TV 62–63
 european Patent Office Database 215
 experimental tools 308
 extended focus image (EFI) 163

f

far-field technique 328, 345
 Feldkamp–Davis–Kress (FDK) method 231
 feature size 269, 327–328, 341, 344
 feedback loop 307, 335–337, 369
 ferroelectric LC (FLC) 4
 fiber optics sensors 388–389
 field of view (FoV) monocular FoV
 (MFoV) 68
 field of view binocular FoV (BFoV) 32, 47,
 68, 84, 89
 field stitching 345
 fill factor capture 72, 75
 fill factor display 75, 84, 89
 filtered backprojection 231
 final design 306–307
 flicker noise 6–7
 fluorescence imaging 334
 fluorescent light 142
 force measurement 187, 232
 forward model 283–290
 Fourier 15
 Fourier hologram 12, 97, 136, 165, 170–172
 Fourier inverse 124, 139, 248
 Fourier transform 124, 139, 248
 Fourier-scatterometry 343, 346–356
 fractal dimension 355
 frame rate of video 1–2, 5–7, 21, 35, 40,
 59, 73, 75
 Fresnel
 Fresnel hologram 19, 22, 123, 136, 142,
 147–148, 150–152, 155, 165–172, 242

Fresnel incoherent correlation holography
 (FINCH) 147–148, 150–153, 156
 Fresnel zone plate (FZP) 142, 243, 249
 fringe density 396, 418
 fringe identifying 423
 fringe integrator 424
 fringe order 289, 311
 fringe processing 374, 424
 fringe projection 288, 332
 fringe reflection technique (FRT) 399–402
 fringe systems 419, 422–423, 425, 432
 fringe-locus function 310–311
 fringes 58, 86–87, 101, 104, 107, 150,
 240–242, 244, 246, 248–249, 251, 289, 380,
 400–401, 417–418, 420, 422, 425–429, 432
 full-field-of-view (FFV) 308

g

genetic algorithms 344, 355
 geometric transformation 166, 175
 ghost imaging 23
 ghost traps 184
 google Patent 215–216
 gradient force 180
 graphics processing units (GPU) 43
 grating interferometer 383
 gratings and lenses approach 184
 grooves 394
 guide to the expression of uncertainty in
 measurement GUM 352

h

harsh agents 370–375
 harsh environment 369–390
 head mounted display, HMD 21, 49
 head-up display 21
 Helmholtz equation 195–196, 198
 hermite-gaussian beams 198
 heterodyne detection 142–143, 287
 hierarchical supramolecular organization
 190–192
 hole drilling 369, 432–433
 holocamera 414–415
 holografika 33, 40, 42
 holographic display 42–43, 58–59, 62–70,
 77–83, 91, 96, 98, 105, 108, 115–116
 hologram, several entries
 hologram capture 13, 22, 63, 92
 hologram classification - volume reflection
 97, 99, 113
 hologram computer generated 65, 80, 83,
 121–133
 hologram digital 140
 hologram in-line 95

- hologram phase shifting 63
 - hologram synthetic aperture 147–159
 - holographic 3D display 34
 - holographic illumination 419–421, 433
 - holographic interferometry (HI) 13, 288, 383, 413–433
 - holographic lithography 13–14
 - holographic optical tweezers 179–200
 - holographic sensor 12–13
 - holographic stereogram 43, 59, 98
 - holographic visualization 21–22
 - holography, several entries
 - holoprinter 97–98, 115–117
 - homodyne detection 142–143
 - human eye observation conditions 84
 - human vision 57
 - human visual system 32, 47–48
 - humidity 369, 371–373
 - hybrid approach 328
- i**
- identification problem 329–331
 - ill-posed 330–331, 341
 - ill-posedness 328, 330
 - image conjugate 95, 140, 144, 182, 199, 241, 276, 419
 - image removal, DC image 62–63
 - image real 60, 65–68, 84, 87, 241, 419, 421, 427
 - image reconstruction 45, 61, 84, 334
 - image restoration 334
 - 3D image scale error 233
 - image signal modeling 261–263
 - image synthesis 334, 340
 - image twin image removal 87, 136, 151, 155–156
 - imaging, several entries
 - imaging 2D 37–39, 45–47, 57–58, 60, 96–99, 116, 124–125, 135–136, 138, 230–231
 - imaging 3D 36–39, 44, 96, 122, 135, 164, 225–238
 - immersion technologies 341
 - Ince-Gaussian beams 198–199
 - incoherent, several entries
 - indicator 48, 50, 210, 338–339, 353, 360, 413
 - indirect problem 331
 - indirect strategy 306
 - inertial measurement unit (IMU) 305
 - inertial sensor 328
 - initial design 306–307
 - in-line digital Fresnel holography 73
 - in-line metrology 327
 - instrument transfer function 290, 336
 - integral imaging 33, 36, 39–41, 45–46
 - intellectual property IP 207–223
 - interference microscopy 260, 340, 351–352
 - interferogram 243, 248, 288–289, 310–311, 317–318, 374, 386, 413–421, 423, 426, 429, 432, 434
 - interferometer 4, 11, 73, 123, 135, 147, 240–246, 248, 251, 277, 284–285, 287–292, 309–310, 338, 354, 369–372, 374–386, 390, 404–405, 414–415
 - interferometry 13, 72, 96, 98, 239, 277, 288–289, 294, 297, 340, 369–389, 395–397, 413–433
 - international technology roadmap 327
 - invention 96, 207–208, 212, 214–223
 - invention disclosure form IDF 221
 - inverse model 283–284, 286–287, 290–301
 - inverse problem 283, 285, 328–331, 336–337
 - IP protection 207, 210–211, 217, 223
 - IP rights 211, 218
 - iterative fourier transformation algorithm (IFTA) 184
- j**
- joint ownership 219
 - Jones matrix 8, 10, 12, 352
 - Joule heat 320
- k**
- keyhole problem 58, 84
 - kissing bonds 394, 395
- l**
- Laguerre-Gaussian beams 194, 198
 - laser ultrasonics (LUS, LAUS) 393–394, 398, 404–406, 408
 - length measurement error E 235–237
 - lenticular lens method 36–37
 - licensing 212, 220–222
 - line edge roughness LER 267, 270, 278, 344–348
 - line feature 264, 266–267
 - liquid crystal on silicon (LCoS) 1, 59, 187, 245
 - liquid crystal shutter glasses 32–36
 - liquid crystal spatial light modulator (LC SLM) 13, 40, 42, 60, 402
 - Lorentz force 180
 - Lorenz-Mie theory 180
 - low-pass filter 6, 332

m

macro interference pattern 429
 magnification 86, 127–129, 150, 152
 magnification of display angular 86
 magnification of display longitudinal 86
 magnification of display transverse 150, 152
 mask work 209–210
 master object 13, 419–422
 Mathieu beams 190, 196–197, 200
 maximum permissible error MPE_E 237
 Maxwell-equations-solvers 262
 Mccutchen theorem 248–249
 measurand 260–261
 measurement uncertainty 257, 260, 265–268
 measuring limit 418
 mechanical loading 395–396
 mechanical shock 389
 MEMS accelerometer 314, 319
 MEMS gyroscope 314
 MEMS inspection 305–323
 MEMS switch 308, 317, 319–321
 meta-material 341–343
 Metrological traceability 257–260
 micro interference pattern 429–430
 microdevice 305, 321
 microelectromechanical system, MEMS 1, 168, 187, 227, 283, 305, 328, 337, 358
 microfluidics 181
 microgyro 314, 318
 microgyroscope 314, 317–319
 microlens array 137
 micromanipulation 179, 192, 195–199, 201
 193 nm microscopy 273
 microscopy applications 13–16, 22
 microstructuring 13
 microswitch 308, 314, 316–317, 320–322
 microsystem 305, 308
 millyscale to microscale ranges 322
 minimum reconstruction distance 64–65, 70
 mirror 1–3, 14, 18–20, 40–42, 44, 58–60, 76–77, 80–82, 85, 97, 101, 154–155, 182, 186–187, 242, 245–246, 277, 287, 351–352, 354, 379, 386–387, 396–397, 400–401, 421
 model-based analysis 261, 269
 model-based metrology 328, 334
 multi CCD holographic capture system 72, 84–85
 multi SLMs holographic display system 85
 multicolor holographic recording 107, 111–115
 multi-photon microscopy 13
 multiple cameras 31, 45–46, 61, 741–75

multiple image planes 178
 multiple patterning 332, 334, 341
 multiple SLMs 42, 61
 multiple viewpoint projections (MVP) 135
 multiplexing spatial 11, 35, 40, 59, 79, 137, 154, 172
 multiplexing temporal 40, 78–79
 multi-region measurement 338
 multiscale analysis 337–339
 multi-scale sensor fusion 328

n

near real-time 322, 328
 near field 328, 340, 342, 345
 negative index materials 341
 nominal-actual value comparison 232
 Non-Destructive Testing (NDT) 229, 393–402
 non-diffracting beams 194–197
 noninvasive measurements 322
 novelty 208, 214
 numerical aperture 142, 150, 163, 180, 185–186, 256, 291, 293, 332, 358

o

3D objects 31, 40, 45, 58–59, 71, 75–76, 99, 121–126, 135, 137, 143, 147, 164, 226, 240–241
 object size 73, 76, 127, 150, 229, 426
 observation mode “asymmetrical diffuser” 76, 83, 88
 observation mode “naked eye” 76, 83, 88
 observation mode binocular 47, 68, 84–85, 89
 off-axis 68, 87, 95, 97, 135–136, 142–147, 159, 173, 243–244, 340, 429
 office of technology transfer, OTT 220
 Ohmic-type MEMS switch 320
 one shot interferometer 390
 on-line 142, 146
 optical angular momentum 181
 optical assembly 190
 optical binding 199
 optical Coherence Tomography (OCT) 225, 239
 optical comparison 418–419, 422
 optical flow 45
 optical microscope 185, 255–256, 260, 270–274, 278
 optical non-destructive testing (optical NDT) 396–397
 optical scanning 121–122, 135, 142–147
 optical sorting 181
 optical switching 19

optical transfer function 290, 332
 optical tweezers 179–200
 optoelectronic holography (OEH) 309–312
 optoelectronic laser interferometric
 microscope (OELIM) method 322, 328
 optoelectronic laser interferometric
 microscope (OELIM) system 308,
 312–313
 optoelectronic methodology 309–312
 orbital angular momentum 195–196,
 198, 200

p

paraboloidal 154
 parallax barrier method 36–37
 paraxial approximation 66, 70–71, 143
 patent 19, 39, 208–222
 patent corporation treaty PCT 213–215
 Pendry's perfect lens 342
 3D perception cues 32, 47
 phase change on reflection 285, 289
 phase difference 169, 311, 372, 380,
 418–421
 phase modulation 4, 7, 9–11, 12–17, 19,
 102, 104–107, 150, 185, 187,
 phase shift procedure 245–247
 phase shifting digital holography 246–247
 phase shifting polarization interference
 microscopy 340
 phase singularity 195, 243
 phase space diagrams (Wigner charts) 65
 Photoactivated Localization Microscopy,
 PALM 256, 341
 photonic band gap materials 188
 photopolymers 44, 99, 104–105, 108,
 111–113
 photoresist 105–106, 108
 physiological cues 47
 pixelated phase-mask interferometer 385
 plant patent 208–209
 point spread function (PSF) 13, 16–17,
 136, 357
 polarization modulation 9–10, 13, 16–18, 35
 polarizing glasses method 32, 35–36
 pores 191, 394–395
 portable device 432
 portable interferometer 375, 414–418
 power spectral density 285, 290, 355
 pressure 47, 179, 305, 313, 370–371, 373,
 378, 389, 396
 prior art 214–216
 projection onto the constraint sets
 (POCS) 139

propagation algorithm between parallel
 planes 82
 propagation algorithm between tilted
 planes 82
 prototype design 306–307
 PSF-engineering 13, 16–17
 psychological cues 47
 pulse code modulation, PCM 7
 pulse shaping 19
 pulse width modulation, PWM 6
 puzzle read-out (PRo) technique 426–428

q

quadratic phase function 136–137, 140,
 142, 149
 quality factor (Q-factor) 323
 quantitative microscopy 255–257, 260
 quasi-common path interferometer
 380–381, 387
 quasicrystalline structures 188

r

radiation 98, 107, 113, 142, 179–180, 230,
 234, 256, 264, 273, 370–371, 374–375, 378
 radiation force 180
 radiation isolation 378
 Rayleigh approximation 165
 Rayleigh criterion 101, 157, 322
 Rayleigh resolution limit 144
 rays optics approximation 180
 real world objects and scenes 79
 reconstruction artifacts 239
 reconstruction distance 22, 64–67, 70,
 81–87, 136–137, 150, 164, 167, 170,
 172–173
 reconstruction noise 139, 233, 237
 reconstruction numerical 13, 88, 163–175,
 431–432
 reconstruction optical 101
 reconstruction optoelectronic 62
 reconstruction problem 330, 337
 recording materials 43
 reference surface 288, 432–433
 reflectometry 343, 393–394, 396–398, 408
 registered IP 210
 regularization 330–331, 334, 340
 reliability 105, 111, 307, 320, 322, 350, 354,
 389
 reliable electrical interconnection 322
 residual stress 311, 369, 384–385, 431–433
 resolution 332
 resolution enhancement 256, 273, 276, 379,
 334, 338–340
 response time 7, 9, 11–12, 35, 43, 49

rewritable holographic stereogram 43
 RF MEMS switch 308, 316, 319–321
 rigid body motion compensation 433
 rigorous coupled wave analysis (RCWA)
 261–262, 297, 336
 robust interferometer 380, 430
 rod-shaped bacteria 1189–190
 RSS-type uncertainty 311

S

Sagnac interferometer 243, 245, 248
 sampling parameters mismatch in 86
 scalability 322
 scanning 142–147, 235–237, 350, 406,
 426, 429–431
 scanning error PF (form) 236
 scanning error size (PS) 235–237
 scanning white-light interference
 microscopy 350
 scattering force 180–181
 scatterometry 279, 295, 343–355
 scenes dynamic 72
 scenes static 43, 61
 scratches 355, 359–360, 394
 see real technology 19, 21, 59
 Seereal 19, 21, 34, 43, 59
 segmentation algorithm 87
 self compensating interferometer 381
 self-healing property 194–195
 self-similar beams 197–200
 sensitivity 269, 300, 348–350
 sensitivity analysis 300, 348–350
 sensor fusion 299, 328, 334, 335, 357–338
 servicemark 210
 shearography 13, 387–389
 sidewall angle, SWA 258, 271, 295, 345
 silver halide emulsions 105–108
 simulator sickness questionnaire
 (SSQ) 48
 single-beam-gradient trap 180
 source trajectory 231, 233
 space-bandwidth product 59, 66, 70, 76–78,
 80, 86, 327–328, 333
 spatial coherence comb 248–252
 space spatial frequency analysis 3, 6,
 10–11, 60, 67, 97–98, 101, 104,
 127–128, 139–140, 142–145, 171, 249–251,
 285, 290, 332–333, 340, 397
 spatial light modulator (SLM), 1–23 (full
 chapter) 40, 57, 70, 77, 79–80, 83, 91, 172,
 243, 245, 276, 328, 336, 379, 402–403
 spatial light modulator (SLM) amplitude
 9–11, 19–20, 23

spatial light modulator (SLM) liquid crystal
 (LCSLM) 58–60
 spatial light modulator (SLM) phase only 70,
 77, 80, 91
 spatial light modulator (SLM) virtual 79–80,
 83
 spatial phase-only
 spatial positions 45
 spatial resolution 43, 58, 101, 128, 142, 159,
 187, 232, 328, 385
 spatially structured illumination 341
 speckle contrast 332
 speckle Multiframe 63
 speckle noise 21, 59, 77, 424
 speckle reduction 62–63
 spectroscopic ellipsometry 343–344,
 346–348
 Spherical 64, 67, 70, 77–78, 80, 107–108,
 142, 144, 147, 149, 153–154, 156, 165, 170,
 180, 187, 189, 241, 420–422
 start up 220–222
 stereograms 59, 98
 stereoscopic displays 32–36
 stimulated emission depletion microscopy,
 STED microscopy 16, 256, 341, 363
 stochastic optical reconstruction microscopy,
 STORM 256, 341
 structured light 45
 sub-wavelength feature 340–342, 345
 sub-wavelength imaging 341–342
 super multi-view (SMV) display 44
 super-lens 341–343
 superresolution 328, 334, 341, 363, 365
 superresolution microscopy 16
 superresolution structured illumination
 microscopy, SR-SIM 341
 supramolecular organization 190–192
 surface form
 surface plasmon polaritons 341
 surface profilometry 252, 350
 surface roughness 236, 385, 321, 397
 surface topography 285, 290, 292, 294, 301,
 355
 2D/3D switching display 38
 synthetic aperture 136
 synthetic aperture with fresnel elements
 (SAFE) 136, 147–159
 synthetic diffraction grating 173
 system aberrations 337

T

tailored light fields 193, 200
 television (TV) 58
 television 3D (3DTV) 32, 57, 60, 62–63, 91

television holographic 57–90
 television real time 3DTV 64
 temperature 7, 12, 102–103, 264, 313, 321, 369–372
 temperature isolation 378
 template matching 336
 test object 229, 408, 414, 419–423
 texture features 355
 theoretical upper limit 425
 thermal loading 387, 408, 422
 thermal movement of X-ray source 237
 thermography 393–394, 399–400, 408
 thin film 84, 291–295
 three-dimensional display 31–50
 threshold-/gradient-based surface determination 235–237
 tilted plane wave illumination of SLM 78, 81
 tilted planes 82, 88, 168
 time-of flight (TOF) 45
 top-down strategy 335
 total measurement uncertainty (TMU) 35–36
 traceability 29, 57–58, 229, 257
 trade secret 210–11
 trademark 210–215
 transmission, 76 entries
 transmission and surface relief holograms 98
 triangulation 226, 288, 332–333, 338
 true 3D 57, 92, 344
 two refractive index contouring 419
 two-step and two-frequency upconversion 40
 two-wavelength contouring 419, 421

u

ultrasound
 uncertainty analysis 266, 307–308, 352
 utility patent 209–210

v

van Cittert-Zernike theorem 241
 vertically aligned nematic, VAN 3
 vibration isolation 378–379
 vibrations 59, 274, 313, 374–376, 378–381, 384, 385, 387–388
 vibrometer 13, 405, 416
 video 3D holographic 60, 84, 89–90
 video electro-holographic
 viewing angle of holographic display off-axis 68, 87
 viewing angle of holographic display on-axis 65, 84–85
 visual fatigue 32, 44, 47–50
 visual perception 59, 62, 68, 70, 84, 92, 97–98, 116–117
 volumetric displays 40–42

w

wave (several entries)
 wave front sensing 290–291
 well-posed 330
 white-light 135, 136, 338, 340, 350–354, 356
 white-light interference fourier-scatterometry 351, 353
 Wigner distribution function (WDF) 64
 world intellectual property organization WIPO 213

x

X-ray component alignment 234
 X-ray cone-beam tomography 238
 X-ray tomography (X-CT) 230–237

z

zcam 32, 45
 zeolite crystals 191
 zero order term 61