

# Index

- 2.5D, 3, 203–204  
 2D, 22, 33, 37, 49, 52–53, 121, 160–164, 168,  
 171–175, 187, 200–217, 272  
 3D, 1, 3, 12–16, 20, 32–34, 37, 40, 49–50, 63–54,  
 118, 121–122, 130, 137, 145–147, 183–196,  
 199–222, 230, 232–238, 242–245, 261, 267,  
 271, 273, 294, 297, 300  
 3D Studio Max, 184
- Access Grid, 233–234, 238  
 Support Centre, 238  
 ActiveMap, 311  
 Administrative Gazetteer, 263  
 Advisory Group on Computer Graphics, xiv  
 aerial photography, 18, 115, 141–158, 242–243,  
 252–255, 257  
 Afterburner, 113  
 AJAX, 268, 274  
 animation, xiv, 3, 49–65, 124, 141, 190, 273, 282,  
 303  
 temporal, 53  
 Apollo 8 mission, 67  
 Arc2Earth, 15  
 ArcExplorer, 183  
 ArcGIS, 12, 15, 22, 167, 262–263  
 ArcGlobe, 13  
 ArcMap, 263  
 ArcScene, 184  
 ArcView, 217  
 armchair traveller, 110  
 Arts and Humanities Research Council, 247, 257  
 Arts Council England, 257  
 assimilation, data, 230–231  
 attribute space, 50, 160–168, 171–179  
 travel, 180
- Augmentra Ltd., 246  
 avatar, 192  
 AVS/Express, xii, 35
- ballotbank.com, 54  
 bar chart, 33–34, 70, 271–272  
 beamtrees, 201  
 Beck, H., 4, 33  
 belief engine, 224–226, 237  
 Berezina River, 301  
 best matching unit, 161  
 Bewick, T., 252  
 BitNet Management, 137  
 black death, 302–304  
 Black, J.W., 142  
 Blair, T., 69  
 Bleasdale-Shepherd, I., 201  
 bluetooth, 309–310, 315  
 Booth, C., 204, 210  
 boreholes, 215, 233  
 boundary map, 273  
 British Geological Survey, 232, 257  
 British Valuation Office Agency, 142,  
 149  
 brushing, *see* linking and brushing  
 Buck, P., 105
- CAD/CAM, 141, 199, 242, 245  
 cadastral map, 115, 150  
 Can You See Me Now, 307, 309–310  
 cartogram, 32–33, 68, 105, 173, 180, 202, 210,  
 273  
 area, xiv  
 generating computer algorithm, 68

## 320

cartography, xiv, 5–6, 11, 20, 50–53, 61–62, 160, 223, 277, 280, 294  
 history, 2  
 multimedia, 2  
 CAVE, *see* ReaCTor  
 Ce:wolf, 271  
 ceiling painting, 247–248, 253–256  
 cell ID, 310–316  
 census data, xii, 15, 21, 53, 156, 159, 160, 166–167, 173, 178, 261, 264, 268–269  
 centre for advanced spatial analysis, 184, 187  
 CERN, 103  
 Chakrabati, S., 153  
 champagne glass, 105–107  
 change blindness, 58–61  
 Chat Moss, 242–255  
 Chavez, H., 92  
 Chernoff faces, 285  
 choropleth map, xv, 21, 25, 33, 36, 54, 56, 269, 272–273, 280  
 cinematography, 62  
 Cities Revealed, 142, 145  
 climate attributes, 22, 159–160, 166–179, 284  
 clustering, 28, 33, 159–166, 173–175  
 colour matching, 230  
 colour-blind, 36  
 Colwell, R., 6  
 CommonGIS, 34, 40  
 communist manifesto, 107  
 computer-assisted mass appraisal, 142, 150  
 Conrad, J., 1–2  
 Context Phone, 309–311  
 contour cell, 229  
 contour plot, 25  
 contrast, data, 231–232  
 Cumbria, 243–246  
 Keswick, 243  
 Newlands Valley, 244  
 cvs, 34  
 Cyberguide, 311  
 cyberspace, 192  
 cyclic-time, 52  
 data documentation initiative, 259–275  
 data mining, 3, 29–30, 160, 189, 216  
 data sharing, 259–275  
 Day of the Figurines, 313–316  
 Decennial Supplements, 260–261  
 Deng, K., 87  
 DEVise, 40  
 difference-view, 35

## INDEX

diffusion equation, 68  
 Digital Earth, 1, 3, 11–12, 23, 159  
 digital surface model, 243–244, 257  
 digital transition, 5–6  
 digitization of learning materials programme, 267  
 dimensional anchor, 216  
 Director, 113  
 domain, spatial, 294  
 domain, temporal, 294  
 Doom, 199  
 Doomsday project, 109–110, 138, 203  
 draftsman, 297  
 dual-view, 31  
 Economic Commission for Europe, 78  
 elastic window, 38  
 Environmental Research Group, 190  
 epidemiologist, 302  
 Ere be Dragons, 309  
 ERSI, xii  
 shapefile format, 169  
 ethnographer, 307, 310  
 European Union, 257  
 Excel, 259, 273  
 exploded view, 210  
 exploratory visualization, 5, 25–42, 50, 215, 294  
 Facebook, 184  
 Fanon, F., 88–89  
 fine art, 246  
 First World War, 142, 152  
 fish-eye, 201, 210  
 Flash, 3, 40–41, 118, 138, 267, 274  
 Flickr, 184, 188, 193, 195–196  
 fly-through, 49, 53, 122  
 focus and context, 4, 32  
 Ford, A., 104  
 fractal landscape, 54  
 Fried, M., 248  
 Galbraith, J.K., 90  
 ganglion cell, 225  
 GB Historical GIS, 261–263, 267  
 General Packet Radio Service, 308  
 geobrowser, 11–13, 20, 22–23  
 geocaching, 200  
 geodemographic, 155  
 GeoExploratorium, 109–111, 113–117, 123–125  
 GeoExpress, 233–234  
 GeoFusion, 13

- Geographic Information System, *see* GIS  
 geographical analysis machine, 274  
 geoid, 15–16  
 GeoInformation Group, 145  
 geoportal, *see* portal  
 geostatistical analyst, 167  
 geotagging, 193, 195  
 GeoTools, 268, 273  
 GeoVista, 40  
 geovisualization, xi, xiv–xvi, 25–48, 51, 57, 61, 179, 293–306  
 GeoWall, 235  
 GeoWizard, 38, 41  
 Geraldine, 97  
 Getmapping, 142, 257  
 GHOST, xi, xii  
 GINO, xi, xii  
 GIS, xii, 2, 5, 11, 15–16, 19, 21–23, 51, 56, 124, 141, 145–147, 149–150, 156, 159–164, 166–167, 169–173, 178–179, 184–185, 189–190, 199–200, 216–217, 247, 255, 264, 269, 273, 278–280, 286–288  
 GIScience, 51, 62, 246–249, 256, 277, 280–282, 286–288, 294–295  
 GKS, xii  
 glacier, 53, 244–245  
 glyph, 201–202, 213, 215, 280  
 Google Earth, 2, 7–8, 11–23, 50–51, 142, 145–147, 152–154, 156, 160, 183–184, 186–190, 193, 195–196, 233–234, 241, 299–300, 315  
 Google Map, 2, 5, 8, 33, 183–184, 193, 196  
 Google SketchUp, 185–186, 194  
 Google Video, 196  
 Googleplex, 189  
 Gore, Al., 1, 3, 12, 22, 146  
 GPS, 6, 8, 16–17, 33, 145, 160, 175–178, 195, 246, 256, 277, 295, 298, 307–310, 315–316  
 grandmother cell, 226  
 graphical lens, 36  
 Great American History Machine, 265  
 Gross National Product, 79–80  
 ground truth, 19, 242–244  
  
 Hägerstrand's time geography, 293, 295–296  
 Haggett, P., 52, 100  
 Harley, J.B., 2, 19  
 Hawaii, 211–214  
 Heidegger, M., 248–250  
 Herman grid illusion, 229  
 Hewitt, W.T., 224  
  
 hexagonal neighbourhood, 161, 168–169  
 hidden-symbol problem, 203–204, 209  
 Higher Education Funding Council of England, 256  
 histogram, 33, 36, 50, 233–234, 282, 285  
     3D, 204  
     circular, 33  
 Hitchers, 310–315  
 HomeFinder, 36  
 Hotel Habbro, 203  
 human space perception, 217  
 human visual system, 224–229, 236  
 hurricanes, 175, 177–178  
     Katrina, 20, 203  
 Husserl, E., 248–250  
  
 I Like Frank, 307, 309  
 IBM Explorer, xii  
 Idris, K., 102  
 IDRISI, 166  
 illusions, 226–232  
 iMAX, 213  
 immersive, 5, 50, 54, 244–245  
     environment, 12, 184, 210, 224, 237  
     non-, 109–140  
     technology, 223–240  
 Improvise, 39–40  
 in-fill development, 152–153  
 information visualization, 160, 201–202, 216, 223, 294  
 information visualization cyberinfrastructure, *see* IVC  
 Inside Reality, *see* Schlumberger  
 interferometric synthetic aperture radar, 257  
 intermediary cell, 225, 229  
 internet-based neighbourhood information systems, 154–155  
 iPod, 267  
 IRIS Explorer, 35  
 IVC, 40–41  
 IVEE, 36  
  
 Java, 40–41, 268, 308  
     3D, 298  
     JGraph, 312  
     Jview, ILOG, 41  
 Jewell area, 132  
 Joint Information Systems Committee, 271  
  
 k-means, 29, 161, 174–176  
 Kanizsa triangle illusion, 229

## 322

Karnik, K., 86  
 Kasser, T., 97  
 Keyhole Earthviewer, 13, 146, 188  
 Keyhole Markup Language, *see* KML  
 Kibede, L., 73  
 kinetic depth effect, 210, 213  
 Kissinger, H., 69  
 KML, 12, 15, 146, 196  
 Kyi, A.S.S., 72

Landsat, 146  
 landscape visualization, 241–258  
 Lawlor, D.A., 79  
 Lawrence, G., 142  
 Lennon, J., 101  
 leukaemia rates, 51  
 Leviathan, 93  
 LIDAR, 29, 33, 234, 242, 245  
 lighting conditions, 57  
 linking and brushing, xiv, 4, 37, 38  
 LinkWinds, 40  
 London, 145, 204–211  
   Underground, 4, 33  
   Virtual, 184–196  
   Waterloo, 195  
 London charter, 238  
 losing the cursor, 237  
 Luxemburg, R., 69, 107

Mach, E., 227  
 Macromedia  
   Afterburner, 113  
   Director, 113  
   Shockwave, 113–114  
 Make Poverty History, 69  
 Manchester Visualization Centre, 232  
 MANET, 30  
 MapInfo, 209, 216  
 MapQuest, 5, 160  
 mash-up, 8, 15, 18, 20–21, 183–184, 193  
 match theory of information, 283  
 Matlab  
   SOM Toolbox, 161, 169  
 Matsuura, K., 76  
 Menzel, A., 248  
 Merleau-Ponty, M., 248  
 meta-data, 238, 242, 255–257, 259–275  
 metaverse, 192–193  
 Microsoft Local Live, *see* Microsoft Virtual Earth  
 Microsoft Virtual Earth, 2, 8, 12, 20, 142, 147,  
   183, 193, 196, 241

## INDEX

military intelligence, 152  
 Miller, B., 19  
 Minard, C.J.  
   Napoleon campaign, 4, 299–302  
 Minnesota Population Centre, 260  
 mobile  
   devices, 2, 5–6, 36  
   phone, 77, 160, 193–196, 212, 246, 256, 267,  
     295, 307–318  
 MODIS, 54  
 Mondrian, 34, 40  
 Monmonier, M., 7–8, 50–51  
 Morningstar, C., 192  
 movie map, 54, 109  
   Aspen, 109–111, 138  
 MPEG, 113, 308  
 multidimensional, 33, 57, 62, 160, 216  
   scaling, 164  
 multiform, 31, 37  
 Multimaps, 269  
 multimedia, 2, 5, 141, 183, 308–309  
   non-immersive, 109–140  
 multimedia messaging service, 308  
 multiple view, 25–48, 211, 216, 282, 298–299  
 multiview exploration, *see* multiple view  
 Myanmar Times, 93  
 MyLifeBits, 33  
 MySpace, 184, 193

NASA World Wind, 2, 12, 51, 183  
 National Climate Data Centre, 167  
 National Lottery, UK, 263, 267  
 navigation, 2, 7, 37, 40, 55, 110, 116, 195, 244  
   slaving, 38  
 nCube, 260–274  
 negative and positive, 231–232  
 neural network, 161  
 neurobiologist, 224–225  
 neurons, 179, 226  
 Newman, M., 67–68  
 NEXTMap, 257  
 Nobel prize, 226  
 Nokia  
   N93, 308  
   N95, 195  
   Series 60, 308

Office of National Statistics, 268  
 ontology, 255  
 OpenDX, 206  
 optic nerve, 225–226

- optical art, 230
- optical illusions, *see* illusions
- Oracle, 262–263, 269, 271
- Ordnance Survey, 145, 190, 255–256, 257
  - Digital National Framework, 6
  - Mastermap, 145, 257
- Organisation for Economic Cooperation and Development, 77–78
- orthogonal, 145–147
- orthogonal projection, *see* projection, orthogonal
- orthophotography, 146
- panoramic, 5, 110, 187–188, 195
- para-data, 238
- parallel coordinates, 33–36, 160, 179, 201, 216
- Patel, M., 74
- PDA, 194, 307–308, 310, 316
- PeopleGarden, 311
- personal digital assistant, *see* PDA
- perspective projection, *see* projection, perspective
- phenomenology, 248–253
- Phoenix metro, 277, 288
- photo-realistic, 200, 242
- photogrammetry, 6, 145–150, 156, 185–186, 242, 245
- photoreceptor, 225
- PICASSO, xi
- Piccolo, 40–41
- Pickles, J., 19
- Pictometry International Corp., 142
- pie chart, 33, 285
- pixel-based displays, 216
- planar map, 3, 5, 160, 209
- Planning and Compulsory Purchase Act, 152
- PlayStation 3, 186, 241
- population map, xii, 68, 128
- portal, 5–6, 12, 22, 145–147, 152–156, 188
- poverty, 69–70, 76–78, 88–92, 204–204, 210–210, 265–265
- Prefuse, 40–41
- presence, 223–224
- prism map, 202
- privacy, 9, 20, 149, 152–153, 295
- projection
  - Mercator, 13
  - orthogonal, 206–209
  - perspective, 207
- purchasing power parity, 88–97
- PV-WAVE, xii
- Quake, 199
- quaternary triangular mesh, 13–14
- Queensland video atlas, 111–112
- QuickBird, 146
- QuickTime, 113–114, 117–118
  - Virtual Reality, 187
- radar, 242–246
- railway, Liverpool-to-Manchester, 252
- ReaCTor, 233
- REDUX gallery, 255
- Registrar General for England and Wales, 260
- Replayer, 307
- replicate-and-overlay, 35
- representative fraction, 18
- retina, 16, 225–226
- rich triad, 75, 77, 90, 95
- risk management, 284–286
- Rocky Mountains, xiii
- rotary club, 302–304
- Rowntree, S., 88
- Roy, A., 95
- rubber-sheeting, 21, *see* elastic
- saccades, 58
- satellite imagery, 8, 22, 54, 145–146, 152, 156, 242, 282
- satnav, 2, 200
- scalable vector graphics, *see* SVG
- scatterplot, 25–26, 33, 34
  - Moran, xv
- Schlumberger Inside Reality, 233
- scientific visualization, 141, 199, 202, 223, 294
- Second Life, 184, 192–193, 203
- Second World War, 142, 152
- self-organizing maps, 159–182
  - attribute space, 178
  - spherical, 179
- semantic web, 238
- SenSay, 311
- sense-making model, 26
  - Pirolli and Card, 27
- Shockwave, 113–114
- shoebox dataset, 27–29
- short messaging service, 193, 309
- Siddiqi, K., 98
- Sithole, N., 75
- Sketchpad, 199
- Smiles, S., 251
- Smith, A., 96
- Smith, D., 80

## 324

Snow, J., xv, 4  
 social sorting, 154–155  
 SOM-PAK, 161, 169–170  
 South East Arts, 257  
 space-time  
   cube, 214, 293–306  
   path, 160, 175, 295, 297, 303  
   prism, 295, 297  
 spatial literacy in teaching, 256  
 spatio-temporal representation, 294  
 Spelman, C., 153  
 Spence, B., 223  
 split attention, 50, 55  
 SpotFire, 36, 40  
 spring method, 164  
 Stanford Encyclopedia of Philosophy, 93  
 statistical package for social sciences, 259  
 Stephenson, G., 249  
 stereoscopy, 145, 213, 230, 232–235  
 surrogate travel, 109–140  
 surveillance, 9, 142, 152–155  
 Sutherland, I., 199  
 SVG, 40–41, 267, 274  
 SYMVU, 204  
  
 table-lens view, 33  
 Tarjanne, P., 103  
 taxonomy  
   Bloom, 125–131, 138  
 telemedicine, 200  
 temporal  
   abstraction, 54  
   legend, 55  
 tessellation, 12–14, 167  
 three-dimensionl, *see* 3D  
 time granularities, 294  
 time line visualization, 314  
 time-geography, 297  
 Tobler's way, xv  
 TOPO, 6  
 topography, 16, 19, 130, 202, 214–215, 244  
 tornado, 177–178  
 Tournachon, G-F., 142  
 Townsville GeoKnowledge project, 130, 138  
 transparency, 37, 207, 210, 215, 243–245, 280  
 Tweets, 193–196  
 Twitter, 184, 193  
 two-dimensional, *see* 2D  
  
 U-matrix method, 161  
 UK Data Archive, 259–260

## INDEX

UK National Archives, 268  
 UK Perspectives, 142  
 ultrasound, 232–233  
 uncertainty  
   anthropology, 282  
   visualization, 277–291  
 Uncle Roy All Around You, 307  
 United Nations  
   Development Programme, 69, 85  
   Millenium Development Goals, 68, 76, 88  
 United Nations Statistical Division, 69  
 United Nations University, 105  
 Universal Declaration of Human Rights, 76, 106  
 US Census Bureau, 178  
 US National Health, 260  
 US National Historical GIS, 264  
  
 Valve Software, 201  
 Victorian society, 250  
 video conferencing, 233  
 Viewranger, 246  
 vignette, 251  
 virtual body, 206  
 Virtual Earth, *see* Microsoft  
 virtual field trip, 235  
 virtual globe, 2–3, 7, 13, 50, 146, 241  
 virtual reality, 32, 141, 233–235  
 Virtual Reality Modelling Language, 109, 118,  
   121–122, 134, 137  
 virtual social space, 192–195  
 virtual space, 6, 110, 134, 138, 184, 256  
 virtual tour, 135, 146  
 Visage, 40  
 Viscovery SOMine, 161, 169  
 visible human, 206  
 Vision of Britain, 267–273  
 vistrails, 38  
 visual  
   analytics, 216, 294  
   clutter, 228  
   depth cues, 213  
   visual city, the, 183–197  
   Visual Geosciences Ltd., 233–234  
   visualization density, 151  
   voronoi region, 171  
  
 Waldman, A., 84  
 walk-through, 122  
 water balance model, 278  
 Web Map Server, Open Geospatial Consortium,  
   269

## INDEX

325

- WiFi, 315
- Windows Vista, 200
- Wing, C., 81
- Wolfenstein 3D, 199
- Wood, D., 19, 56
- World Bank, 260
- world geodetic system, 16
- World Health Organisation, 69, 74
- World Institute for Development Economics  
Research, 105
- World of Warcraft, 192
- World Wide Web, xii, 5, 102, 103
- worldmapper.org, 67–107
- wretched dollar, 88–89
- Xbox 360, 241
- XML, 15, 146, 260–264
- YouTube, 196

