

FOREWORD by <i>Mark Tribe</i>	x
PROLOGUE: VERTOV'S DATASET	xiv
ACKNOWLEDGMENTS	xxvii
Introduction	2
A PERSONAL CHRONOLOGY	3
THEORY OF THE PRESENT	6
MAPPING NEW MEDIA: METHOD	8
MAPPING NEW MEDIA: ORGANIZATION	11
THE TERMS: LANGUAGE, OBJECT, REPRESENTATION	12
1 What Is New Media?	18
HOW MEDIA BECAME NEW	21
PRINCIPLES OF NEW MEDIA	27
1. Numerical Representation	27
2. Modularity	30
3. Automation	32
4. Variability	36
5. Transcoding	45
WHAT NEW MEDIA IS NOT	49
Cinema as New Media	50
The Myth of the Digital	52
The Myth of Interactivity	55
2 The Interface	62
THE LANGUAGE OF CULTURAL INTERFACES	69
Cultural Interfaces	69
Printed Word	73
Cinema	78

HCI: Representation versus Control	88
THE SCREEN AND THE USER	94
A Screen's Genealogy	95
The Screen and the Body	103
Representation versus Simulation	111
3 The Operations	116
MENUS, FILTERS, PLUG-INS	123
The Logic of Selection	123
"Postmodernism" and Photoshop	129
From Object to Signal	132
COMPOSITING	136
From Image Streams to Modular Media	136
The Resistance to Montage	141
Archeology of Compositing: Cinema	145
Archeology of Compositing: Video	149
Digital Compositing	152
Compositing and New Types of Montage	155
TELEACTION	161
Representation versus Communication	161
Telepresence: Illusion versus Action	164
Image-Instruments	167
Telecommunication	168
Distance and Aura	170
4 The Illusions	176
SYNTHETIC REALISM AND ITS DISCONTENTS	184
Technology and Style in Cinema	185
Technology and Style in Computer Animation	188
The Icons of Mimesis	195

THE SYNTHETIC IMAGE AND ITS SUBJECT	199
Georges Méliès, the Father of Computer Graphics	200
<i>Jurassic Park</i> and Socialist Realism	201
ILLUSION, NARRATIVE, AND INTERACTIVITY	205
5 The Forms	212
THE DATABASE	218
The Database Logic	218
Data and Algorithm	221
Database and Narrative	225
Paradigm and Syntagm	229
A Database Complex	233
Database Cinema: Greenaway and Vertov	237
NAVIGABLE SPACE	244
<i>Doom</i> and <i>Myst</i>	244
Computer Space	253
The Poetics of Navigation	259
The Navigator and the Explorer	268
<i>Kino-Eye</i> and Simulators	273
<i>EVE</i> and <i>Place</i>	281
6 What Is Cinema?	286
DIGITAL CINEMA AND THE HISTORY OF A MOVING IMAGE	293
Cinema, the Art of the Index	293
A Brief Archeology of Moving Pictures	296
From Animation to Cinema	298
Cinema Redefined	300
From <i>Kino-Eye</i> to <i>Kino-Brush</i>	307

THE NEW LANGUAGE OF CINEMA	309
Cinematic and Graphic: Cinegratography	309
The New Temporality: The Loop as a Narrative Engine	314
Spatial Montage and Macrocinema	322
Cinema as an Information Space	326
Cinema as a Code	330
INDEX	335

Index

- Abstract Expressionist paintings, 306
- Acrobat software, 16
- Action
- illusions versus, 164–167
 - narrative and, 247
 - representation versus, 17
- Active Worlds, 197, 317
- Adobe software, 16, 137, 155–156. *See also* Photoshop software
- Adorno, Theodor, 37, 125
- Advanced Research Projects Agency (ARPA), 102
- Advertising banners, 42, 123
- Aesthetic dimension, 66–67
- Aesthetic object, 163–164
- After Effects software, 137, 156
- AI software, 33–34, 183
- Akvaario* (Aquarium), 318–319
- AL software, 32, 67–68, 182
- Aladdin*, 306
- Alberti, Leon Battista, 80–81, 95, 105
- Algorithms
- animation and, 3, 190–191
 - database and, 221–225
 - object and, 27
 - simulation and, 193
 - texture-mapping, 53
- Alias/Wavefront software, 80, 137, 155, 197
- Alice in Wonderland*, 112, 290
- ALIVE (virtual environment), 33
- Alpers, Svetlana, 90–91, 327
- Althusser, Louis, 61
- American Standard Code for Information Interchange (ASCII), 330–333
- Ames Virtual Environment Workstation, 165–166
- Analytical Engine, 20–23, 48
- Animation
- algorithms and, 3, 190–191
 - cinema and, 298–300
 - Graphical User Interface of leading software for, 80
 - synthetic realism in, 188–195
 - 3-D, 3, 138, 184–185
- “Anna Karenina Goes to Paradise” (Lialina), 221
- Antonioni, Michelangelo, 291, 303
- Apollo 13* (1995), 303
- Apple (company), 7, 39, 69, 71–72, 74, 311
- Arabesque* (1975), 236
- Architecture Machine Group, 259
- Architecture, modern, 264
- ARPA, 102

- Ars magna Lucis et umbrae* (Kircher), 106
Art of Describing, The (Alpers), 90–91
Art and Illusion (Gombrich), 181
Artificial intelligence (AI) software, 33–34, 183
Artificial life (AL) software, 32, 67–68, 182
ASCII films, 330–333
Aspen Movie Map, 259, 261, 264, 275, 281–282
Assembler, 117
Assembly line, 29–30, 326
Auge, Marc, 279–280, 284
Augusta, Ada, 22
Aumont, Jacques, 81
Aura, 170–175
Auto-deconstruction, 208
Automation, 32–36, 85
- Babbage, Charles, 20–23, 48
Bad Day on the Midway, 210
Bal, Mieke, 227, 246–247
Bandwidth, 256, 275
Bann, Stephen, 181
Banner ads, 42, 123
Baron Prásil (Baron Munchhausen, 1961), 159–160
Baroque painting, 324
Barthes, Roland, 28–29, 103–104, 119, 125, 163, 230
Battleship Potemkin (1925), 150–151
Baudelaire, Charles, 268–273
Baudot, Jean Maurice-Emile, 332
Baudry, Jean-Louis, 108–109
Bazin, André, 181, 185–187, 189, 198
Becher, Bernd, 233
Becher, Hilla, 233
Benjamin, Walter, xx, 107, 171–175, 269, 329
- Berger, John, 105
Berlin, 3-D model of, 87
Bête, La (Zola), 247
Bettmann Archive, 130
Bettmann, Otto, 130
Big Optics, 172–173
“Big Optics” (Virilio, 1992), 171
Binary code, 25
Birds, The (1963), 40, 160
“Black Maria” (Edison), 23
Blade Runner (1982), 63–64, 115, 291
Blair, David, 39–40, 227
BlindRom V.0.9. (1993), 92
Blow-Up (1966), 291
Body of user, screen and, 103–111
Boeing, 193, 277
Bogart, Humphrey, 194
Boissier, Jean-Louis, 320–321
Bolsheviks Returning Home after a Demonstration (Komar and Melamid), 203
Bolter, Jay David, 89
Bordwell, David, 187–190, 198, 242
Borge, Jorge Luis, 225
Bosch, Hieronymus, 327
Boss, Hugo, 271
Bots, 33
“Bottom-up” approach, 11
Boustani, Christian, 328–329
Brackage, Stan, 306
Branching-type interactivity, 38, 128
Broadband cinema, 322–326
Brothers Quay, 262
Browsers, Web, 7, 31, 76, 82, 272, 329
Bruegel, Pieter, 327
Brugge (1995), 328
Bryson, Norman, 105
“Burghers of Calais, The” (Rodin), 113
Burial at Ornans, A (Courbet), 322
BUZZ watch, 35

- C language, 117
CAD programs, 121
Calder, Alexander, 265
Camera controls, virtual, xvi, 84–88
Camera obscura, 104, 106
Cape Cod network, 101–102
Capital (Marx), 58
Carrey, Jim, 310
Cartesian coordinate system, 45, 254
Catalog (1961), 236, 242
Catherine the Great, 145–146, 154, 167
Cave metaphor of Plato, 108, 131, 283
CD-ROM, 19, 70, 219–220, 222–223, 311–313, 320
Cervantes, Miguel, 234
Chirico, Giorgio de, 265
Chomsky, Noam, 41, 79
Chronology, personal, 3–6
Cinegratography, 309–314
Cinema
 animation and, 298–300
 broadband, 322–326
 as code, 330–333
 compositing and, 145–149
 computer and, xv, 287–289
 cultural interfaces and, language of, 10, 78–88
 database and, xxiv, 237–243
 digital technology and, xxxi
 history of, 8, 71–73
 Hollywood, 147, 152, 194–195, 242, 300
 indexical nature of, xviii, 293–296
 as information space, 326–330
 language of, 309–333
 avant-garde versus mainstream, xxvi
 cinegratography, 309–314
 code and, 330–333
 information space and, 326–330
macrocinema and, 322–326
“primitive” to “classical,” 107
spatial montage and, 322–326
temporality and, 314–322
term of, 7
understanding, xv
linear pursuit and, 237
loop form, xxxii–xxxiii, 314–322
Mannerist stage of, xxix
moving image, 293–308
 animation-to-cinema and, 298–300
 archaeology of, 296–298
 kino-eye to kino-brush and, 307–308
 narrative and, 293–296
 redefinition of cinema and, 300–307
 new media and, 50–51, 287
 organization of information and, 72
 overview, 287–292
 postcomputer, 249
 representation and, 289–292
 spectatorship, 186–187
 synthetic realism in, 185–188
 term of, 71
Cinematics, 83
Cinematograph, term of, 24
Cinematographic expertise, 86
Cinématographie camera/projection hybrid, 23
Cineon (Kodak), 137
Classical Hollywood Cinema, The, 198
Classical screen, 95–96
Cliffhanger (1993), 138
Closed interactivity, 40, 56
Clothing design, 122
COBOL language, 117
Combination prints, 153
“Combination Training Device for Student Aviators and Entertainment Apparatus” (Link, 1930), 276

- Command and Conquer*, 33
Communication functions, Jakobson's model of, 206
Communication, representation versus, 17, 161–164
Comolli, Jean-Louis, 186–190, 198
Complex database, 233–236, 274
Composer 4.0 software, 155
Composer software (Alias/Wavefront), 137
Compositing
cinema and, 145–149
digital, xix, 139, 144, 152–155, 305–306
montage and
new types of, 155–160
resistance to, 141–145
process of, 136–141
video, 149–152
Compression techniques, 53–54
Computer
animation
algorithms and, 3, 190–191
cinema and, 298–300
Graphical User Interface of leading software for, 80
synthetic realism in, 188–195
3-D, 3, 138, 184–185
cinema and, xv, 287–289
culture and, 9, 124
development of, 21–26
image, 45–46
Macintosh, 63
mouse, 110
multimedia, 311
programming, xxxiii, 317
software, 11
Computer layer of new media, 46
Computer media language, 7
Computer media revolution, 19–20
Computer Space, 253–259, 281
Computer-based image, 289–292
Computing-Tabulating-Recording Company, 24
Conceptual transfer, 47
Confession (Rousseau), 320
Content, levels of, 37
Continuous data, 28
Continuous trajectory, 285
Control, 16–17, 88–93
Cooper, James Fenimore, 270–271
Corbis Corporation, 130
Cosic, Vuk, 330–333
Courbet, Gustav, 322
Crary, Jonathan, 173
Creatures, 68, 182
Cultural interfaces
definition of, 69–70
language of, 69–93
cinema, 10, 78–88
Human Computer Interface, 10, 88–93
overview, 69–73
printed word, 10, 73–78
Cultural layer of new media, 46
Culture
computer and, 9, 124
information, 13–14
online versus off-line, 333
open source and, 333
“real,” 232–233
visual, 13, 56
Culture industry, 36–37, 125
“Cut and paste” operations, 65, 130–131, 135, 301
Cut with the Cake-Knife (1919), 126
Cyber Fighter, 277
Cybernetics (Wiener), 251
Cyberspace, 250–251
Cyberspace (Novak), 250

- Dada, 56
- Daguerre, Louis-Jacques, 20–21, 147
- Daguerreotype, 20–22, 106
- Dark City*, *The* (1998), 269
- Database
- algorithms and, 221–225
 - cinema and, xxiv, 237–243
 - complex, 233–236, 274
 - definition of, 218
 - logic, 218–221
 - Man with a Movie Camera* and, xxx
 - media, 37
 - narrative and, 225–228
 - paradigm and, 229–233
 - representation driven by, 40
 - syntagm and, 229–233
- Data cowboy (Gibson), 250–251
- “Data Dandy” (Lovink), 270–271
- “Data Flâneur” (Lovink), 270
- Dataglove (Nintendo), 5
- Davies, Char, 261
- De Certeau, Michel, 246, 267–268, 279–280
- “Death of the Author, The” (Barthes), 125
- Deferral of meaning, 290
- Deleuze, Gilles, 255
- Density of contemporary information, xxxvi
- Density of pictoral displays, xxxvi
- Dickson, William, 51
- Diderot, 233–234
- “Diderot, Brecht, Eisenstein” (Barthes), 103
- Die Spätromische Kunstindustrie* (The late-Roman art industry), 253
- Digital compositing, xix, 139, 144, 152–155, 305–306
- Digital Domain, 303
- “Digital Hitchcock” (Mamber), 221
- “Digital House, The” (Hariri & Hariri, 1988), 145
- Digital media players, 118
- Digital, myth of, 52–55
- Digital painting, 305
- Digital revolution, xxxi
- Digitization, 28, 49, 52
- Dioptric arts, 103–104
- Discrete data, 28
- Distance, 170–175
- DJ, 134–135, 144
- Doom*, 78, 84, 195, 210, 244–253, 257, 272, 275, 278
- Draughtsman's Contract, The* (1982), 104, 238
- Dr. Strangelove* (1964), 278–279
- Dreamweaver software, 119
- Dubuffet, Jean, 265
- Dunes* (Miyake), 122
- Dungeon Keeper*, 84, 91
- Dürer's print, 105–106
- Durkheimian analysis, 280–281
- Dutch painting, 327–328
- DVD, 54
- Dynamation software, 197
- Dynamic new media artworks, 67
- Dynamic screen, 96–98, 115
- E-mail programs, 122
- Eco, Umberto, 170
- Edison, Thomas, 23, 51, 315
- Editing. *See* Montage
- Effects, xxviii, 301, 309
- Eisenman, Peter, 121
- Eisenstein, Sergei, 57–58, 143, 150–151, 156–157
- “Elastic reality,” 301
- Electrification of the Whole Country, The* (Klutsis), 126
- Electronic art, 125–127

- Electronic keying, 150, 152
Elements of Hypermedia Design (Gloor), 272
Equilibrium, state of, 264
Esperanto, visual, xv, 79
Eudora software, 122
Euralille project, 281
EVE, 281–285
Evolution of the Language of Cinema, The (Bazin), 185, 198
Expanded Cinema (Youngblood), 236
Experiential dimension, 66–67
Explorer/navigator, 268–273
Eyeball hang time, 161
- Face of Our Time* (Sander), 233
Falls, The (1980), 238
Film, xxv, 301–302. *See also* Cinema; specific titles
Film architecture, 265
“Film look,” 151
Film: A Psychological Study, The (Munsterberg), 58
Filters
from object to signal and, 132–135
logic of selection and, 123–129
Photoshop and, 121, 129–131
postmodernism and, 129–131
Fisher, Scott, 165–166
Fixed resolution, 53
Flâneur, 268–274
“Flatten image” command, 139, 284, 293
Flight simulators, 276–284
Flora petrinsularis (Boissier), 320–321
Florensky, Pavel, 255
FMV (full motion video), 207
Footprints (user interface agent), 35
Ford, Henry, 29
Forest, The (Waliczky), xxix, 87–88, 261–263, 306
- Forms
database, 218–243
algorithm and, 221–225
cinema, xxiv, 237–243
complex, 233–236, 274
definition of, 218
logic, 218–221
Man with a Movie Camera and, xxx
Media, 37
narrative and, 225–228
paradigm and, 229–233
representation driven by, 40
syntagm and, 229–233
navigable space and, 244–285
Computer Space and, 253–259
Doom and, 244–253
EVE and, 281–285
kino-eye and, 243, 273–281
Legible City and, 260–261
Myst and, 244–253
navigator/explorer and, 268–273
Place and, 281–285
poetics of, 259–268
simulation and, 273–281
3-D, 214–215
overview, 213–217
types of, 310–311
Forrest Gump (1994), 159, 301, 304–305
FORTRAN language, 117
Foucault, Michel, 285, 325–326
Fractal structure of new media, 30–31
Framing, 80–82
Frampton, Hollis, 133–134
Fresco, 305, 322
Freud, Sigmund, 59–60
Friedberg, Anne, 107–109, 273–275, 282
“From Work to Text” (Barthes), 163
Full motion video (FMV), 207
Futurism, 56–57

- "Galapagos" (Sims), 68
Galton, Francis, 57–59
Game patching, 120
Gance, Abel, 323
Garden, The (Waliczky), 87–88, 264, 269
Garriott, Richard, 248
Gates, Bill, 130
Gemeinschaft, 269
Geocities Web site, 123–124
Gesellschaft, 269
Giacometti, Alberto, 265
Gibson, William, 250–251, 262
Gidoni, G. I., 283
Giedion, Sigfried, 217
Giotto, 184, 322
Gloos, Peter, 272
Godard, Jean-Luc, 151–152, 158, 298
Goldberg, Ken, 169–170
Golden Eye, 324
Gombrich, Ernst, 125, 181
Goodman, Nelson, 163
Gore or Uma (Tobreluts), 160
Graphical User Interface (GUI)
of animation software, leading, 80
Blade Runner and, 63–64
"cut and paste" operations and, 65, 131, 135
development of, 88–89, 131, 275
multiple windows and, 324–326
paradigm of 1970s, 213–214
Greenaway, Peter, xxiv, 104, 237–239
Grumann Aerospace Corporation, 193
Grusin, Richard, 89
Gucci, 271
GUI. *See* Graphical User Interface
- Halasz, Frank, 40
Hale's Tours and Scenes of the World (1904), 249
Halftone process, 28
- Harvey, David, 252
HCI. *See* Human Computer Interface
Head-mounted display (HMD), 110
Heemskerk, Joan, 332
Herz, J. C., 245–246
Heuristics of filmmaking, 86
Hierarchy of levels, xxv
"High-level" automation, 32–34
Histoire(s) du cinéma (1989), 151
Hitchcock, Alfred, 40, 160
HMD, 110
Hollerith, Herman, 24, 42
Hollywood cinema, 147, 152, 194–195, 242, 300
Holzer, Jenny, 265
Homer, 233–234
HotWired RGB Gallery, 75, 77
HTML
frames within frames and, 324
high-level computer languages and, 117
Human Computer Interface and, 90
hyperlinking and, 76
modularity and, 30–31
Web page and, 74–76, 120
Huckleberry Finn (Twain), 270
Huhtamo, Erkki, 158
Human Computer Interface (HCI). *See also* Interface
computer data and, xxxvi
concept of, 72
cultural layer of new media and, 46
history of, 72–73
HTML and, 90
interactivity and, 55, 101
language of cultural interfaces and, 10, 88–93
modern, 210
organization of information and, 72
origin of, 69
term of, 72

- Hypercard software, 74, 76, 127
- Hyperlinking
- association and, 61
 - function of, 41
 - HTML and, 76
 - hypermedia and, 77
 - network of, nonhierarchical, 16
 - structure of, 41–42
 - teleporting and, 161, 164–165
 - Torah and, 76
- Hypermedia, 38, 40–41, 77, 215, 272, 288
- I/O/D collective, 76
- IBM, 24
- Icarus myth, 185, 188
- Iconic code, 25
- Icons of mimesis, 195–198
- Ideological montage, 149
- Iliad, The* (Homer), 233–234
- Illusions
- action versus, 164–167
 - interactivity and, 205–211
 - narrative and, 205–211
 - overview, 177–183
 - questions regarding, 178–183
 - synthetic image and, 199–204
 - Jurassic Park* and, 200–204
 - Méliès and, 200–201
 - overview, 199
 - socialist realism and, 201–204
 - 3-D, 198
 - synthetic realism and, 184–198
 - animation, 188–195
 - in cinema, 185–188
 - icons of mimesis and, 195–198
 - overview, 184–185
- ILM, 201
- Image-instruments, 167–168, 183
- Image-interface, 17, 183
- IMMEMORY (Marker), 221
- Imprisonment of body, 80, 105–106
- Industrial Light and Magic (ILM), 201
- Industrial Revolution, 29
- Information access, 217
- Information culture, 13–14
- Information Landscape (Silicon Graphics), 250
- Information processing tasks, 216
- Information space, cinema as, 326–330
- Information Visualizer (Xerox PARC), 250
- Informational dimension, 66
- Innis, Robert, 48
- "In Search of a Third Reality" (1995 computer art festival), 5
- Interactivity
- branching-type, 38, 128
 - closed, 40, 56
 - Human Computer Interface and, 55, 101
 - illusions and, 205–211
 - menu-based, 38, 67
 - myth of, 55–61
 - narrative and, 228
 - open, 40, 56
 - virtual reality technology and, 82
- Interface. *See also* Graphical User Interface (GUI); Human Computer Interface (HCI)
- cultural interface language, 69–93
 - cinema, 10, 78–88
 - Human Computer Interface, 10, 88–93
 - overview, 69–73
 - printed word, 10, 73–78
 - dichotomy, 67
 - kino-eye, 276
 - Macintosh, 69
 - overview, 63–68
 - screen and user, 94–115
 - body of user and, 103–111

- development of screen, 95–103
 overview, 94–95
 representation versus simulation, 111–115
 3-D and, 80–84
 VRML, 83
 window, 97–98
- International Business Machines Corporation (IBM), 24
 “International style” of modern visual culture, 56
- Internet. *See* World Wide Web
- Interpellation, 61
- Interpretation of Dreams, The* (Freud), 59
- Introduction to Poetics* (Todorov), 12–13
- Invisible Shape of Things Past, The* (ART+COM), 87, 88–89
- Ippolito, Jon, 42–43
- Jacquard, J. M., 22
- Jacquard loom, 22, 42, 48
- Jakobson, Roman, 77, 206
- Jameson, Fredric, 131, 229–230, 252
- Jay, Martin, 105, 175
- Johnny Mnemonic* (1995), 216, 313, 318
- Johnson, Paul, 147–148
- Johnson-Laird, Philip, 60
- JPEG format, 54, 290
- Jurassic Park* (1993), 138, 142, 152, 200–204
- ‘Just in time’ delivery, 36
- Juxtaposition of elements, 158–159
- Kabakov, Ilya, 266–268
- Kaufman, Mikhail, 240
- Kepler’s camera obscura, 104, 106
- Keying, 150, 152
- Kiefer, Anselm, 265
- Kinetoscope, 23, 40, 298, 313, 315
- Kino-brush, 307–308
- Kino chturekh izmereneii* (“The Filmic Fourth Dimension”), 156
- Kino-eye, xxviii, 243, 273–281, 307–308
- Kino-Pravda* (“Cinema-Truth”), 149
- Kleiser-Wolczak Construction Company, 194
- Kodak, 137, 197
- Komar, Vitaly, 203
- Koolhaas, Rem, 115, 281
- Krauss, Rosalind, 234–235
- Kruger, Barbara, 142
- Kuhn, Thomas, 285, 314
- Laboratory experimentation, 15
- Lacan, Jacques, 174–175
- Lakoff, George, 60
- Language
 - C, 117
 - of cinema, 309–333
 - avant-garde versus mainstream, xxvi
 - cinegratography, 309–314
 - code and, 330–333
 - information space and, 326–330
 - macrocinema, 322–326
 - “primitive” to “classical,” 107
 - spatial montage, 322–326
 - temporality, 314–322
 - term of, 7
 - understanding, xv
 - COBOL, 117
 - computer media, 7
 - concept of, 7, 12–13
 - of cultural interfaces, 69–93
 - cinema, 10, 78–88
 - Human Computer Interface, 10, 88–93
 - overview, 69–73
 - printed word, 10, 73–78
 - effects and, xxviii
 - FORTRAN, 117
 - VRML, 250

- Languages of Art* (1976), 163
Lanier, Jaron, 57–59
Late Spring (Morandi), 327
Latour, Bruno, 167, 169
Laurel, Brenda, 165
Lawnmower Man (1992), 110–111
LCD displays, 63, 134
Lefebvre, Henri, 252
Legible City (Shaw), 226, 260–261
Legrady, George, 221, 263–264
Letizia (user interface agent), 35
Level editors, 120
LeWitt, Sol, 235
Lialina, Olga, 221, 227, 324–325, 328
Lichtenstein, Roy, 29
Life of an American Fireman, The (1903), 148
“Life Spacies” (Sommerer and Mignonneau), 67
Lincoln Laboratory, 101–102
Linear perspective/pursuit, 85, 237
Lingo language, 31, 117
Link, E. A., Jr., 276
Lisa computer (Apple), 71
Lissitzky, El, 262
Live-action footage, xxxi, 137, 302, 307–308
Live Picture (image-editing program), 53
Locke, John, 152
Lockheed, 277
Logic of new media, 48
Logic of selection, 123–129, 132
Looker (1981), 194
Loop form, xxxii–xxxiii, 314–322
Lossy compression, 54
Lovink, Geert, 270–271
“Low-level” automation, 32, 34
Lucas, George, 43, 138, 193, 201
Lucasfilm, 137, 193
Lumière brothers, 23
Lunenfeld, Peter, 63
Lüsenbrink, Dirk, 87
Lyotard, Jean-François, 219
MacDraw software, 126
Machines of the Visible (Comolli), 198
Macintosh computer and interface, 63, 69, 72
McLaren, Norman, 306
McLuhan, Marshall, 48
Macrocinema, 322–326
Macromedia Director software, 30–31, 117, 123
Magnetic tape, 234
Malevich, Kazimir, 262
Mamber, Stephen, 40, 221
Man with a Movie Camera, xiv–xxxvi, 148–149, 172, 239–242, 262, 275–276, 316, 327
Mannerist stage of cinema, xxix
Mapping new media
method, 8–10
organization, 11–12
Marey, Etienne-Jules, 110
Marey’s photographic gun, 51
Mario, 272
Marker, Chris, 221
Marx, Karl, 58, 65
Marxism, 187
Marxist dialectics, 58
Mask, The (1994), 310
Matador (paint program), 53
Matrix, concept of, 262
Matrix, The (1999), 330
Media database, 37
Media Lab (MIT), 33
Mediamatic, 224
Melamid, Alex, 203
Méliès, Georges, 200–201
“Menagerie” (Fisher), 226

- Menu-based interactivity, 38, 67
Menus
from object to signal and, 132–135
logic of selection and, 123–129
Photoshop and, 129–131
postmodernism and, 129–131
Metarealism, 208
Metropolis (1923), 126
Metz, Christian, 294, 310
Michelson, Annette, 241–242
Microsoft, 191. *See also specific software*
Microsoft Office software, 30, 182
Microsoft Outlook, 122
Microsoft Word software, 39, 124
Mignonneau, Laurent, 67
“Mill” (Babbage), 21–22
Miller, Robyn, 248
Mimesis, icons of, 195–198
Minimalism, 235
MIT
Architecture Machine Group, 259
Lincoln Laboratory, 101–102
Media Lab, 33
Radiation Laboratory, 100–101
Software Agents Group, 35
Mitchell, William, 52–54, 303–304
Miyake, Issey, 122
Mobile camera, 79–80
Mobility, xvi
Mobilized virtual gaze, 107, 274–275, 282
Möbius House, 317–318
Modernity, 279–280, 284
Modernization, xxii, 173–174
Modularity, 30–31, 36, 139–141
Mohr, Manfred, 236
Monroe, Marilyn, 194
Montage compositing and new types of, 155–160
resistance to, 141–145
ideological, 149
images and, unrelated, 56
indexical nature of cinema and, xviii
ontological, 158–159
realities and, fake, xvii
spatial, xxxiv, 158–159, 322–326
stylistic, 158–159
temporal, xvii, xxxiv, 148–149
Moody, Rick, 44–45
Morandi, Giorgio, 327
Motion simulator, 249
Mouse, computer, 110
Moving image
animation-to-cinema and, 298–300
archaeology of, 296–298
kino-eye to kino-brush and, 307–308
narrative and, 293–296
redefinition of cinema and, 300–307
MPEG format, 54, 141
MTV, xxix
Multimedia, 311
Münsterberg, Hugo, 57
Muschamp, Herbert, 128–129
Music synthesizers, 126
Music video, 310–311
Musser, Charles, 108, 129–130
Mutability, 133–134, 307–308
Mutoscope, 298
Myst, 7, 70–71, 78, 127, 210, 244–253, 312–313
Myth: The Fallen Lords, 84
“Myth of Total Cinema, The” (Bazin), 181, 185
Nadar, Félix Tournachon, 98, 200–201
Nake, Frieder, 235–236
Nakomete (On the Comet, 1970), 159
Napoléon (1927), 148–149, 323

- Narrative
action and, 247
database and, 225–228
in Greek sense, 246
illusions and, 205–211
interactivity and, 228
live-action, xxxi, 137, 302, 307–308
loop as engine of, 314–322
moving image and, 293–296
- NASA Ames Virtual Environment
Workstation, 165–166
- Navigable space
Computer Space and, 253–259
Doom and, 244–253
EVE and, 281–285
kino-eye and, 243, 273–281
Legible City and, 260–261
Myst and, 244–253
navigator/explorer and, 268–273
Place and, 281–285
poetics of, 259–268
simulators and, 273–281
3-D, 214–215
- Navigation, concept of, 272–273
- Navigator/explorer, 268–273
- Neale, Steven, 321
- Negroponte, Nicholas, 259
- Netomat browser, 31, 76
- Netscape Navigator, 7, 272
- New media
categories of, 19
chronology and, personal, 3–6
cinema and, 50–51, 287
computer-media revolution and,
19–20
development of, 21–26
emergence of, 6–7
fractal structure of, 30–31
layers of, 46
logic of, 48
- mapping, 8–11
method, 8–10
organization, 10–11
myths of, 52–61
digital, 52–55
interactivity, 55–61
old media versus, 49
overview, 19–20
principles of, 27–48
automation, 32–36
modularity, 30–31, 36, 139–141
numerical representation, 27–30
transcoding, 45–48
variability, 36–45, 133–134
- terms of, 12–17
language, 12–13
object, 14–15
representation, 15–17
theory of present and, 6–8
visual index to, xiv–xxxvi
writings on, 10
- “New Vision” movement (1920s), xvi,
85
- Nintendo Dataglove, 5
- Non-places (Auge)*, 279
- Non-transparency of code, 64–65
- Nouvel, Jean, 281
- Novak, Marcos, 43, 250
- Numerical representation, 27–30
- Object
aesthetic, 163–164
algorithms and, 27
concept of, 14–15, 27
old media and, 28
in Photoshop, 31
- Russian Constructivists and Produc-
tivists and, 14
- scalability and, 38–40
- signal and, 132–135

- Odessa steps, 150–151
Odyssey (Homer), 233–234
Office of Naval Research, 102
“On Computable Numbers” (Turing), 24
“100 Objects to Represent the World” (Greenaway), 238–239
Ontological montage, 158–159
Open interactivity, 40, 56
Open source, 333
Operations
 compositing, 136–160
 cinema, 145–149
 digital, 139, 144, 152–155
 montage and, 141–145, 155–160
 process of, 136–141
 video, 149–152
menus, filters, and plug-ins, 123–135
 from object to signal and, 132–135
 logic of selection and, 123–129
Photoshop and, 129–131
postmodernism and, 129–131
overview, 123–135
teleaction, 161–175
 distance and aura, 170–175
 illusion versus action, 164–167
 image-instruments, 167–168
 representation versus communication, 161–164
 telecommunication, 161–164, 168–170
Oracle software, 225
Osmose (Davies), 261, 265–266
- Paesmans, Dirk, 332
Page, 74–75, 206. *See also* Web page
“Painter of Modern Life, The” (Baudelaire), 268–273
Painting, 305–306, 324, 327–328
Palace of the Institute (Paris), 21
- Palm Pilot, 63
Panofsky, Erwin, 253–254, 257–258
Paper architecture, 264–265
Paradigm, 229–233, 314. *See also* Data-base
Parrhasius, 177–178, 195
Pencil of Nature (Talbot), 233
Periodic updates, 38
Permanent present, 63
Permutations (1967), 236
Perspectival window, 105
Perspectives as Symbolic Form (Panofsky), 254
Phantasmagoria (1799), 296
Phantom Menace, The (1999), 331
Phenakistoscope, 51, 304
Photography, 19, 28, 98, 106–107
Photomontage, 125–126
Photorealism, 200
Photoshop software
 automation and, 32
 development of, 131
 filters and, 121, 129–131
 “flatten image” command in, 139
 menus and, 129–131
 noise to image and, 132
 parts of image and, 31
 plug-ins and, 129–131
 still image in, 140
 users of, 119
 versions of, 39
Pixels, 53–54
Place (Shaw), 281–285
Plato, 108, 131, 233, 283
Plug-ins
 from object to signal and, 132–135
 logic of selection and, 123–129
 media creation software and, 236
 Photoshop and, 129–131
 postmodernism and, 129–131

- Poetics of navigation, 259–268
Point of view, 84, 242
Polygonal modeling, 254–255
Pong, 255–256
Porter, Edward, 148
Postcomputer cinema, 249
Postmodern Condition, The (Lyotard), 219
Postmodernism, 78, 129–131
Potemkin villages, 145–148, 167
PowerAnimator software, 80
PowerPoint software, 124
Practice of Everyday Life, The (de Certeau), 267–268
Prada, 271
Praxinoscope Theater, 297
Premiere 4.2 software, 155–156
Present, theory of, 6–8
Prince, Richard, 142
Principles of Art History (Wölfflin), 254
Principles of new media
 automation, 32–36
 modularity, 30–31, 36, 139–141
 numerical representation, 27–30
 transcoding, 45–48
 variability, 36–45, 133–134
Printed word
 history of, 71–73
 language of cultural interfaces and, 10, 73–78
 organization of information and, 72
 term of, 71
Printing press, 19
Pro-cinematic devices, 296
Procedures, 31
Production on demand, 36
Programming, computer, xxxiii, 317.
 See also specific software
Projector, mechanical, 30
Prokhorov, Anatoly, 207–208
Prostranstvennaya sreda (Florensky), 255
Prouns (Lissitzky), 262
Pudovkin, Vsevolod, 156
Quake, 33, 143, 182, 210, 215, 223, 281
Quantified data, 28
Quattrocento, 172–173
QuickTime format (Apple), 7, 39, 123, 140–141, 157, 290, 311
QuickTime movies, 30, 39, 70, 207, 313, 316–317
Radar, 98–100, 170
Radiation Laboratory (Rad Lab), 100–101
Radio, 162
Radok, Emil, 323–324
Random Access memory (RAM), 77
Razorfish Studios, 213
Readerly text, 119
“Real” culture, 232–233
Real time, 99
Real-time screen, 99, 115
Realism, 184, 186–188, 191. *See also Synthetic realism*
Reality effect, 137
RealityEngine (high-performance graphics computer), 177
RealPlayer, 118
Reasoning, 60
Reconfigured Eye, The (Mitchell), 52–54
Rectangular framing, 80–82
“Rehearsal of Memory” (Harwood), 226
Reijlander, Oscar G., 153
Remediation (Bolter and Grusin), 89
Renaissance painting, 305, 324, 328
Rendering, 53, 191

- Representation
action versus, 17
Barthes and, 103
changes, 16–17
cinema and, 289–292
communication versus, 17, 161–164
computer time-based, 192
concept of, 15–17
control versus, 16–17, 88–93
database-driven, 40
information versus, 17
numerical, 27–30
simulation versus, 16–17, 111–115
space of, 103
- Representational schemes, 125
- Resolution, 28, 53, 204
- Return of the Jedi* (1983), 194
- Reynaud, Emile, 297
- Reys (image-rendering system), 191
- Rheingold, Howard, 110
- Riegl, Alois, 253–254
- Riven*, 210, 216
- Robertson, Étienne Gaspar, 296
- Robinson, Henry Peach, 153
- Rodin, Auguste, 113
- Role-playing games (RPGs), 248, 272
- Rousseau, Jean-Jacques, 320
- Russian Constructivists and Productivists, 14
- Rybaczynski, Zbigniew, 150–151, 158–159, 318
- SAGE (Semi-Automatic Ground Environment), 101–102
- St. Louis Fair (1904), 249
- Salle, David, 142
- Sampled data, 28
- Sander, August, 233
- Saussure, Ferdinand de, 230
- Sauter, Joachim, 87
- Scalability, 38–40
- Scénario du film "Passion"* (1982), 151
- Schleiner, Anne-Marie, 120
- Schwartz, Mayer, 40
- Scott, Ridley, 63
- Screen
Barthes and, 103–104
body of user and, 103–111
classical, 95–96
development of, 95–103
dynamic, 96–98, 115
interactive, 115
overview, 94–95
real-time, 99, 115
representation versus simulation and, 111–115
3-D, 102–103
virtual reality technology and, 97–98
window interface and, 97–98
zapping and, 97
- Screen out, 96
- Scripts, 31
- Scrolling, 75
- Sculpture, 28
- Selection, logic of, 123–129, 132
- Semiosis, 290
- Sengmüller, Gebhard, 331
- 7th Guest, The*, 83, 312–313
- SGI, 82, 191
- Shannon, Claude, 102–103
- Sharits, Paul, 29
- Shaw, Jeffrey, 226, 260–261, 282–285
- Shoah Foundation, 224
- SIGGRAPH (Special Interest Group on Computer Graphics of the Association for Computing Machinery), 34, 85, 178, 194, 196
- Sign, concept of, 170
- Signal, from object to, 132–135
- Silicon Graphics Inc., 177

- SimAnts*, 183
SimCity, 183
Sim games, 183, 223
Sims, Karl, 67–68
Simulation
algorithms and, 193
flight, 276–284
modularity and, 140
motion, 249
navigable space and, 273–281
representation versus, 16–17, 111–115
 Sim games and, 183, 223
Sine wave, 126
Sketchpad, 102, 276–277
Small Optics, 172–173
Smithson, Robert, 265
Snow, Michael, 144
Socialist realism, 201–204
Softimage/3D (v3.8) software, 123
Software. *See* Computer; specific names
Software Agents Group, 35
Soja, Edward, 323
Sommerer, Christa, 67
Sound dimensions, 157
Space
 information, cinema as, 326–330
 as media type, 251–252
 navigable
 Computer Space and, 253–259
 Doom and, 244–253
 EVE and, 281–285
 kino-eye and, 243, 273–281
 Legible City, 260–261
 Myst and, 244–253
 navigator/explorer and, 268–273
 Place and, 281–285
 poetics of, 259–268
 simulation and, 273–281
 3-D, 214–215
 seamless virtual, xix
 3-D, 80, 83–84, 103, 184
 VRML and, 257–259
 Space Invaders, 255
 Space-medium tradition, 265
 Spacewar, 253, 262, 281–282
 Spatial dimensions, 157–158
 Spatial montage, xxxiv, 158–159, 322–326
 Spatialization, 78, 257–258
 Special effects, xxviii, 117, 309
 Spectatorship, cinematic, 186–187
 Speusippus, 233
 Sprites (2-D animated objects and characters), 139–140, 255–256
 Staiger, Janet, 187–190, 198
 “Stairs, Munich, Projection, The” (Greenaway), 239
 Standardization, 29–30, 60
 Star Trek II: The Wrath of Khan (1982), 193–194
 Star Wars (Lucas), 43, 249
 Star Wars: Episode 1 (1999), 138, 195, 199, 201, 303
 Steps (Rybczynski), 150–151, 159
 Stickiness, 161
 Storage media, 234
 Street of Crocodiles, The (Brothers Quay), 262
 Stylistic montage, 158–159
 Subroutines, 31
 Super Cockpit, 111
 Super Mario 64, 84
 Supermodernity, 279–280, 284
 Surfing Web, 205–206, 271
 Surveillance technologies, 98–102
 Sutherland, Ivan, 102–103, 109–110, 276–277
 Svilova, Elizaveta, 239–240
 Swift, Jonathan, 234

- "Sword of Damocles" display, 110
 Symbolic form, 219
 Syntagm, 229–233, 242. *See also* Narrative
 Synthesizers, video, 126
 Synthetic imagery
Jurassic Park and, 200–204
 Méliès and, 200–201
 overview, 199
 socialist realism and, 201–204
 3-D and, 198
 Synthetic realism
 animation, 188–195
 in cinema, 185–188
 icons of mimesis and, 195–198
 overview, 184–185
- T. Rowe Price, 224
 T-Vision (ART+COM), 250
 Tabulating Machine Company, 24
 Tabulating machines, electric, 24, 42
 Tachyscope, 51
 Talbot, William Henry Fox, 233
 Tamagotchi, 68, 318–319
Tango (1982), 158–159, 318
 Tanguy, Yves, 265
 Tape, magnetic, 234
 Tarkovsky, Andrey, 295
Tatlin at Home (Lissitzky), 126
Technology, Style, and Mode of Production
 (Bordwell and Staiger), 198
Tekken 2, 84
 Teleaction
 aura and, 170–175
 distance and, 170–175
 illusion versus action, 164–167
 image-instruments, 167–168
 representation versus communication,
 161–164
 telecommunication, 161–164, 168–170
- Telecommunication, 161–164,
 168–170
Telegarden (Goldberg), 169–170
 Teleporting, 161, 164–165
 Telepresence, 164–167, 170–171
 Teleprinters, 332
 Television, 150, 162
 Tempera painting, medieval, 305
 Temporal montage, xvii, xxxiv, 148–
 149
 Temporality, 103, 314–322
Terminator 2, 152, 200, 204, 310
Tetris, 222
 Text, concept of, 163. *See also* Printed
 word
 Texture-mapping algorithms, 53
 Thaumatrope, 296–297
 Theory of present, 6–8
 Theremin, Lev, 126, 132
 3-D
 animation, 3, 138, 184–185
 automation and, 85
 of Berlin's history, 87
 camera and, 80
 characters, 139–140
 computer animation, 138, 184–185,
 188–195
 computer graphics, 79–80
 interface and, 80–84
 screen, 102–103
 software, 123
 space, 80, 83–84, 184
 navigable, 214–215
 synthetic imagery and, 198
 virtual reality technology and, 81–84,
 206, 257–259, 272
 "Tissue of quotations," 127
Titanic (1997), 142, 153, 164–165,
 195, 201
 Titchener, Edward, 59–60

- Toascii command, 332
Tobreluts, Olga, 160
Todorov, Tzvetan, 12–13, 264
Tomb Raider, 43, 84, 210, 272
Tönnies, Ferdinand, 258
Torah, 76
Touch, 175
Transcoding, 45–48
Transitional Spaces (Legrady), 263
Tron (1982), 190, 199
True Vine, The (Bann), 181
Trumbull, Douglas, 249
Turing, Alan, 24
Twain, Mark, 270–271
2-D graph, 66
2-D images of characters, 139–140, 255–256
2001: A Space Odyssey (1968), 249
“. . . two, three, many Guevaras” (Wagmister), 221
- UN Studio/Van Berkel & Bos, 317–318
Universal Turing Machine, 24
University of Art and Design (Helsinki), 318
UNIX operating system, 34, 129, 332
Unreal, 195, 216, 281
Updates, periodic, 38
URL, 76
U.S. Air Force, 111
U.S. Census Bureau, 23–24
U.S. Marine Corps, 278
- Van Der Kaap, Gerald, 92
Van der Rohe, Mies, 145
Van Gogh, Vincent, 32
Variability, 36–45, 133–134
Variable media, 42–43
Venus by Patricia Field (store), 214
- Versace, 271
Vertov, Dziga, xiv–xxxvi, 148–149, 172, 239–243, 275–276
Viagem, A (The Voyage, 1998), 328
Video
compositing, 149–152
full motion, 207
lossy compression and, 54
music, 310–311
numerical representation and, 28
synthesizers, 126
“Video: The Aesthetics of Narcissism” (Krauss), 234–235
“Video look,” 151
VinylVideo project, 331
Virage, 34–35
Virilio, Paul, 171–175, 278–279
VIR Image Engine (Virage), 34–35
Virtual camera controls, xvi, 84–88
Virtual Glider, 277
Virtual mobile gaze, 107, 274–275, 282
“Virtual museums” genre, 219–220
Virtual pets, 68, 318–319
Virtual reality (VR) technology
Ames Virtual Reality Workstation and, 166
body of user and, 109–110
interactivity and, 82
Lanier and, 58
rectangular framing and, 81–82
screen and, 97–98
simulation and, 113–114
Sutherland and, 276–277
3-D and, 81–84, 206, 257–259, 272
Virtual Sets technology, 154–155
Vision, xxiii, 175
Visual culture, 13, 56
Visual dimensions, 157
Voyeur, 83

- VRML
browsers, 82
interface, 83
language, 250
linear perspective and, 85
rectangular framing and, 81–82
selections and, 197
space and, 257–259
World Wide Web and, 250
worlds of, 275, 279
- Wag the Dog* (1997), 136, 138–139, 153
- Wagmister, Fabian, 221
- Waliczky, Tamás, xxix, 87–88, 261–264, 269
- War and Cinema* (Virilio), 278
- WarCraft*, 91, 182
- Warhol, Andy, 144
- Watson, Thomas J., 24
- Wavelength* (Snow), 144
- WaxWeb* (Blair), 39–40, 227
- Way, The* (Waliczky), 87–88
- Web. *See* World Wide Web
- Web page
creating, 119, 124, 131
data organization and, 16, 222–224
elements of, 75–76, 220–221
HTML and, 74–76, 120
spatialization of moving image and, 157
- WebSpace Navigator, 82
- Web Stalker, 76
- Weinbren, Grahame, 44
- What Dreams May Come* (1998), 310
- Whitney, John, 236, 242
- Whorf-Sapir hypothesis, 64
- Wiener, Norbert, 251
- Wilde, Oscar, 270
- Window interface, 97–98
- Window Shopping* (Friedberg), 273
- Windows 98 Media Player, 118
- Wing Commander* series, 207, 210
- Wisniewski, Maciej, 31, 76
- Wittgenstein's theory of family resemblance, 40
- Wölfflin, Heinrich, 253–254
- "Work of Art in the Age of Mechanical Reproduction, The" (Benjamin), 107, 171
- Work, concept of, 163
- World Wide Web. *See also* Web page
bandwidth, 256
banner ads on, 42, 123
browsers, 7, 31, 76, 82, 272, 329
data distribution and, 35, 222–224
eyeball hang time and, 161
hardcore users and, 161
hypertext of, 65, 77
modularity and, 31
navigating, 272–273
rise of, 225
spatialization and, 257–258
stickiness and, 161
surfing, 205–206, 271
text creation and, 127
updates and, periodic, 38
- VRML and, 250
- Wright, Will, 223
- Xerox PARC Alto workstation, xxxv, 89, 275
- Xerox PARC fountain, 330
- Xerox Star, 71
- Yahoo!, 164
- Youngblood, Gene, 236
- Zabriskie Point* (1970), 303
- Zapping, 97

Zeman, Konrad, 159–160

Zeuxis, 177–178, 195

Zola, Emile, 247

Zoopraxiscope, 51

Zootrope, 51, 296–298, 304

Zork, 246

Zuse, Konrad, 25, 42, 330–331