

Subject Index

- African music, 166–170, 185, 196
Ambiguity, tonal, 116–120, 123–137
Anchoring principle, 223n12
- Bach, Johann Sebastian, 173
 Goldberg Variations, 127–128
 Suite for Violoncello No. 1, 178
 Well-Tempered Clavier, 51, 64
Bartok, Bela, 119
Baum-Welch algorithm, 143, 149–150
Bayesian modeling, 12–14
Bayes' rule, 4, 10–11
Beethoven, Ludwig van, 134–135
 Sonata Op. 53 (“Waldstein”), 95–96
 Sonata Op. 57 (“Appassionata”), 126–127
 Symphony No. 3 (“Eroica”), 74–75
 Symphony No. 5, 157, 164
Brahms, Johannes
 Cello Sonata Op. 38, 106–107
 Clarinet Quintet, 131
 Clarinet Sonata Op. 120 No. 1, 128–130
- Cadences, 133–135, 197
Cage, John, 22
Caldara, Antonio, “Sebben, crudele,” 122
Central pitch, 57
- Central pitch profile, 57
Chart of Regions, 103, 106, 215n3
Chopin, Frederic
 Etude Op. 10 No. 1, 81
 Mazurka Op. 6 No. 1, 112–113
 Mazurka Op. 24 No. 2, 126–127
 Prelude Op. 28 No. 15, 107
Clarity, tonal. *See* Ambiguity, tonal
Communicative pressure, 181–207
Composition, 6, 21–22, 131–137, 159–207
Conditional probabilities, 8–9
Connectionist models, 27
Counterpoint, in Schenkerian theory, 174–175
Cross-entropy, 4, 14–17, 209n5
 and Greek chant improvisation, 154–155
 and key relations, 108
 and Schenkerian theory, 172
 and theories of musical structure, 161–166
- Debussy, Claude, 119
Distribution, 8
Dynamic programming, 37–39, 41, 88–89, 149
- Entropy, 17, 19–21, 124, 187, 209n5
Error detection, 74–76, 77

- Essen folksong collection, 33
 and Bod phrase perception model, 144–147
 creation of, 211n4
 and cross-entropy, 161, 163
 and pitch model, 56–60, 63–64
 and rhythm model, 33, 39–45, 167–168
- Expectation, 19, 21, 26, 50, 66–74
- Expectation maximization. *See* Baum-Welch algorithm
- Finite-state models, 18, 153–156
- Generative processes
 for pitch model, 56–62
 for polyphonic key-finding model, 83–85
 for rhythm model, 31–36
- Graphical models, 29
- Greek chant, 151–156
- Gregorian chant, 20, 201, 206
- Handel, George Frederic, “Hallelujah Chorus,” 95
- Harmony
 explaining common strategies of, 131–137
 in jazz vs. common-practice music, 198–201
 as a factor in key-finding, 93
 interaction with meter, 26, 44–45, 77–78
 modeling perception of, 147–151
 in Schenkerian analysis, 174
- Haydn, Joseph, 134–135
 String Quartet Op. 74 No. 3, 80
- Hidden Markov models, 18–19, 82–83, 142–143, 148
- Implication-realization theory, 67–68
- Improvisation, 151–156
- Independence, probabilistic concept of, 8
- Indian music, 123, 172
- Inertia, 77, 166
- Information theory, 20
- Jazz, 194–196, 198–201
- Joint probability, 8
- Joplin, Scott, “Maple Leaf Rag,” 194–196
- Kalman filtering, 28
- Kern format, 33
- Key, 21, 49–64, 79–137
 ambiguity of (*see* Ambiguity, tonal)
 effect on expectation, 71
 and harmony, 150–151
 hierarchical aspect of, 97–98, 116
 key relations, 94–96, 99–108
- Key-finding models. *See also* Pitch model; Polyphonic key-finding model
 CBMS, 54–55, 64, 89–90
 Krumhansl-Schmuckler, 51–55, 63–64, 89–90, 100, 215n5
 Longuet-Higgins/Steedman, 51, 63–64
 survey of, 50–56
 Vos–Van Geenen, 55, 64
- Key profiles, 51
 CBMS, 54, 86, 91
 Essen, 59–60, 86, 91, 171
 Kostka-Payne, 83–84, 86, 89–92, 99, 100–108, 109, 121, 124, 171
 Krumhansl-Kessler, 51–54, 68, 76, 86, 89–91, 100–105
 Temperley corpus, 86, 90–91
- Kostka-Payne corpus, 84, 200. *See also* Key-profiles, Kostka-Payne
- Linear progression, 177–178
- Major and minor, differences between, 104, 120, 121–125
- Markov chain, 18–19, 22
- Melodic lead, 220
- Mendelssohn, Felix, 20
- Meter, 23–47. *See also* Rhythm model
 and Schenkerian analysis, 178
 and stylistic differences, 166–171, 184–197
- Meter-finding models. *See also* Rhythm model

- Melisma, 43–44, 45, 46
 - survey of, 26–30
- Metrical grid, 24–25, 30
- Minimal description length, 155, 163
- Minor mode. *See* Major and minor, differences between
- Minor scales, 50, 121–122
- Modality, 63, 201–202
- Modulation, 54, 62, 82, 87–88, 92–98, 100, 115–116, 126, 132–133
- Monte Carlo methods, 146
- Morton, Jelly Roll, “Maple Leaf Rag,” 194–196
- Motives, 157, 164
- Mozart, Wolfgang Amadeus, 20, 134–135, 143
 - Piano Concerto K. 503, 81
 - Sonata K. 545, 132, 81
 - Symphony No. 40, 100, 157, 178
- Normal distribution, 35, 57–59
- Note-address system, 41–43
- Note length
 - as factor in meter, 45–46
 - as factor in phrase perception, 147
- Oscillator models of meter, 27, 71–72, 76–77
- Palestrina, Giovanni, 22
- Pan-diatonic music, 97
- Parallelism, as factor in meter, 44, 77
- Parallel perfect consonances, prohibition of, 182–183
- Parameters
 - of pitch model, 59, 69
 - of rhythm model, 32–36
- Perceptual facilitation, 114
- Performance, 26, 41, 191–197
- Performance expression. *See* Rubato
- Phenomenal accent, 45
- Phrase structure
 - effect of meter on, 26
 - modeling perception of, 143–147
- Pips, 31
- Pitch-class set, 81
- Pitch-class set-type, 81–82, 110
- Pitch model, 49–64
 - and cross-entropy, 161–163
 - and error detection, 74–76
 - and expectation, 66–71
 - and key-finding, 62–64
 - and polyphonic key-finding model, 98
- Pitch proximity, 57–58, 143, 221n3
- Pitch spelling, 93–94
- Pivot chord, 132
- Polyphonic key-finding model, 79–137
 - and ambiguity, 116–120, 125–131
 - and key-finding, 85–98
 - and key relations, 99–108
 - and tonalness, 108–116
- Post-skip reversal, 69–71
- Preference rule models, 27
- Probability function, 7–8
- Probe-tone studies, 50, 51–54, 172
- Proximity profile, 57–58
- Ragtime, 194–196
- Rameau, Jean-Phillipe, 134
- Range profile, 56–57
- Rhythm. *See* Meter; Rhythm model
- Rhythm model, 23–47
 - and cross-entropy, 163–164
 - and error-detection, 74–76
 - and expectation, 71–74
 - and meter-finding, 36–47
- Rimsky-Korsakov, Nicolai, 119
- Rock, 167–170, 185, 196, 201–202
- Roman numeral analysis, 148
- RPK profile, 60–61
- Rubato, 167–170, 184–194
- Schenkerian theory, 81, 172–179
- Schoenberg, Arnold, *Verklärte Nacht*, 130–132
- Schubert, Franz, 20–1
- Schumann, Robert, 20, 67
 - Papillons*, 113–116
- Scriabin, Alexander, 119
- Simplicity, as criterion in model selection, 17–18, 145, 155, 163
- Spectrogram, 140
- Speech recognition, 12–13

Statistical learning, 156–158
Stravinsky, Igor, 119
 Sonata for Two Pianos, 97
Swing tempo, 196
Syncopation, 166–170, 184–190,
 194–196

Tactus, 25
Tension, 114–116
Tonalness, 108–116, 120, 125
Trading relationships, 197–202, 206
Transcription, 76, 77, 139–143, 182–
 183
Trees
 in modeling phrase perception, 144–
 145
 and Schenkerian theory, 173, 175–
 176

Vision, 13–14
Voice-leading, 182–184

Webern, Anton, Symphony Op. 21, 20

Xenakis, Iannis, 22