

Index

- AAC, 146, 161
- aacPlus, 146, 161
- acoustic impedance, 15
- acoustics, 13
- auditory filters, 33
 - gammatone, 34
- auditory image model, 49, 66, 70, 75
- auditory nerve, 30
- auditory scene analysis, 48
 - common fate, 49, 118
 - grouping, xxi, 48, 67, 85, 118, 180
 - segregation, 48, 125, 151
 - stream, xxi, 48, 180
- auto-correlation function (ACF), 211
- bandwidth
 - definitions, xv
 - extension, xv, 60, 120, 154
 - blind, xix, 146
 - categories, xviii
 - compression, 162
 - filtering, 81, 124, 155
 - framework, xviii
 - model-based, 176
 - noise abatement, 237
 - non-blind, xix, 146, 161, 197
 - performance measure, 200
 - physical, xviii
 - psychoacoustic, xviii
 - speech, 171
 - theoretical performance bound, 205, 235
 - reduction, xv, 117, 137, 145, 159
- Bayes' rule, 230
- Bessel function, 22, 24
- bilinear transformation, 4
- bit-rate reduction, 159
- cepstral coefficients, 198, 212
- circular triad, 100, 262
- cochlea, 29
 - basilar membrane, 30
 - hair cells, 30
 - non-linearity, 32
 - tonotopic organization, 31, 44
- codebook, 182, 217, 227, 232
 - shadow-codebook, 182, 217, 219
- codec, 145, 159
 - decoder, 159
 - encoder, 159
 - perceptual, 145
- combination tones, 32, 56
- compression, 162
- computational complexity, xxi, 7
- covariance matrix, 209, 223
- critical bandwidth, 34
- decibel, 16
- deconvolution, 147
- difference tone, 33, 56
- differential entropy, 206
- distortion products, 32
- dominant frequency principle, xxiii
- electroacoustics, xvi
- equivalent rectangular bandwidth, 33
- estimation errors
 - spectral envelope, 183
- excitation pattern, 32

- excitation signal, 177, 178, 181, 184
 - explicit generation, 185
 - Hilbert transformation, 188
 - modulation, 188
 - pitch scaling, 193
 - pitch-adaptive modulation, 192
 - spectral folding, 189
 - spectral translation, 190
 - unvoiced sounds, 178
 - voiced sounds, 178
- expectation-maximization (EM), 208, 225
- feature extraction, 197, 207
- feature vector, 207, 216, 218, 220, 228
- filter
 - analysis, 181
 - auto-regressive (AR), 178, 198, 203
 - equalization, 133, 147
 - finite impulse response (FIR), 5, 156
 - infinite impulse response (IIR), 6, 85, 125, 156
 - inverse, 5, 147
 - QMF, 159
 - synthesis, 179, 182
 - Wiener, 148
- frequency
 - spectrum, 3, 103, 151, 163
 - envelope, 159, 196
 - tracking, 10, 91, 123
- gammatone filter, 34
- Gaussian mixture model (GMM), 208, 223, 228
- gradient index, 213
- Gram matrix, 221
- harmonics
 - (un)resolved, 34, 44, 151
 - compression/expansion, 59, 87, 126
 - gain, 86, 125, 158
 - fixed, 86, 125
 - frequency-adaptive, 87, 126
 - level-adaptive, 88, 126
 - signal-adaptive, 158
 - tone duration, 58
- hearing loss, 153
- hidden Markov model (HMM), 226
 - a posteriori probability, 230
 - maximum likelihood (ML), 231
 - parameters, 229
 - states, 227
- intermodulation distortion, 63, 68, 72, 77
 - metric ζ , 64, 68, 72, 77
- Internet audio, 162
- Internet radio, 146, 156
- kurtosis, 213
- Levinson–Durbin algorithm, 179
- line spectral frequencies (LSF), 198, 212, 220
- linear discriminant analysis (LDA), 210, 216
- linear mapping, 219
 - piecewise, 221
- linear predictive coding (LPC), 179
- listening test, xvii, 98, 162
- log spectral distortion (LSD), 199, 204
- loudness, 34, 57, 119, 152
 - equal-loudness contours, 35
 - ISO532A/B, 38
 - just-noticeable difference, 40
 - level, 34
 - listening tests, 40
 - scaling, 35
 - weighting, 37
- loudspeakers, xvi, 16
 - break-up frequency, 18
 - cabinet, 133
 - efficiency, 23, 53, 131, 133
 - electric impedance, 130
 - electrical impedance, 21
 - force factor, 16, 129
 - high, 132, 139
 - low, 134, 139
 - optimal, 134
 - magnet, 129
 - non-linear distortion, 17
 - parameters, 143
 - resonance frequency, 19, 130
 - temporal response, 138
- masking, 41, 65, 145
- minimum mean square error (MMSE), 199, 223, 233
- missing fundamental effect, 56, 239
- MP3, 146
- MP3Pro, 146, 162
- MPEG, 161
- multi-channel sound, 162
- multidimensional scaling (MDS), 101, 261
- MUSHRA, 162
- music

- pitch, 13
- spectrum, 13
- statistics, 13
- mutual information, 205, 208, 215
- noise reduction, 237
- normed frame energy, 212
- paired comparison, 100
- pitch, 42, 118, 149, 213, 239
 - complex tones, 42, 149
 - difference limen, 43
 - dominant partials, 46, 151
 - edge, 43
 - mistuned partials, 43
 - periodicity theory, 46
 - place theory, 44
 - pure tones, 42
 - repetition, 43
 - residue, 42, 46, 56
 - virtual, 42, 56
- preference matrix, 100
- quality, xvii, 97, 162
- score vector, 100
- selective linear prediction (SLP), 203
- separability, 209, 215
- Spectral Band Replication (SBR), 159
- spectral flatness, 214
- speech
 - formants, 8, 178
 - intelligibility, 173
 - mixed mode network, 175
 - narrowband, 172
 - pitch, 8
 - quality, 173
 - source-filter model, 177
 - spectrum, 8
 - statistics, 7
 - unvoiced, 7
 - voiced, 7
 - wideband, 175
- speech-music discriminator, xxii, 8
- Struve function, 22, 24
- subwoofer, 13
- superposition, 2
- systems
 - linear phase, 83
 - causal, 3
 - group delay, 4, 85, 125
 - homogeneous, 2, 61, 80, 154, 163
 - impulse response, 2, 140
 - linear, 2
 - linear phase, 5, 124, 155
 - minimum phase, 5, 147, 179
 - non-linear, 2, 80, 89, 121, 154, 187
 - adaptive clipper, 77
 - clipper, 72, 122
 - integrator, 68, 121
 - multiplier, 61
 - rectifier, 65, 121, 155, 187
 - spectrum, 103, 155
 - stable, 3, 5, 147
 - time invariant, 1
- telephone, xvii, 149, 171
 - bandwidth, 171
- timbre, 46, 57, 118, 151
 - brightness, 47, 57, 118, 152
 - spectral centroid, 47, 57, 118, 152, 214
- transducers, xvi
- transparency, 182
- vector quantization (VQ), 218, 227
- vocal tract, 8, 177
- wave equation, 15
- zero crossing spectral representation, xxiii
- zero crossings, xxiii, 121, 213