

Index

- Alarm 8, 15, 19, 23, 26, 33, 34, 35, 36, 37, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 52, 87, 92, 96, 98, 112, 144, 150, 151, 152, 155, 156, 157, 158, 159, 161, 165, 232
- category/level 89, 90, 91, 93, 180
- delay 37–8
- function 239–42
- limit/criterion/threshold 33, 34, 37, 41, 42, 44, 45, 48, 88, 92, 155, 156, 159, 160, 161, 157, 175, 176, 177, 181, 182, 183
- false 33, 36, 37, 39, 42, 49, 50, 52, 96, 97, 98, 101, 104, 105, 107, 109, 112, 157
- predictive value 39
- Anthrax 2, 3, 17, 50, 84, 131, 165, 170, 171, 172, 173, 177, 178, 179, 180, 181, 182, 186, 187, 189, 225, 237, 240
- Association rules 170, 171
- Average run length (ARL) 9, 21, 32, 36, 37, 38, 40–1, 47, 49, 50, 51, 52, 97, 98, 100, 101, 103, 104, 105, 107, 109, 114, 160
- Bayes/Bayesian 9, 10, 42, 50, 64, 66, 67, 68, 70, 71, 73, 126, 160, 167, 169, 172, 173, 174, 177, 178, 180, 181, 183, 184, 186, 187, 203, 204, 205, 206, 208, 209, 210, 211, 216, 221, 229, 230, 231, 234, 236, 237, 238, 239, 242
- Bayes theorem 203
- Biohazard 240–2
- Bioterrorism 2, 3, 13, 16, 23, 28, 31, 35, 48, 49, 71, 84, 134, 141, 145, 159, 162, 165, 166, 170, 189, 224, 225, 235, 240
- Cluster 2, 3, 9, 51, 55, 106, 115, 116, 117, 118, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 133, 134, 136, 141, 142, 145, 146, 147, 148, 149, 157, 162, 191, 193, 197, 223, 224, 225, 226, 227, 229, 230, 231, 233, 234, 235, 236, 238, 239, 242
- Cluster detection 3, 4, 9, 56, 117, 133, 136, 192, 193, 200, 224, 243
- Cluster modeling 224–30, 238
- Cluster tests 117
- Clustering 2, 4, 6, 9, 31, 50, 51, 55, 63, 65, 68, 80, 117, 125, 131, 134, 146, 157, 159, 162, 198, 202, 223, 225, 226, 227, 229, 230, 231, 233, 234, 238, 239, 242, 243
- Control
- charts 5, 8, 19, 20, 21, 22, 23, 32, 156, 160, 161, 165
- limits 5, 6, 19, 20

- CUSUM
 - chart 6, 8, 21, 102
 - method 3, 9, 21, 40, 44, 45, 46, 48, 50, 51, 95, 96, 98, 106, 112, 113, 155, 157, 158, 159, 161, 162
 - statistic 44, 45, 95, 97, 106, 109, 110, 158, 161
- Empirical Bayes 66, 67, 126
- Exponential
 - distribution/variables 35, 43, 45, 50, 102, 103, 107, 113, 114, 120, 210, 215
 - model 136
- Exponentially weighted moving average (EWMA) 21, 23, 33, 40, 47, 48, 49, 154, 157, 159, 160, 161, 165, 170
- False alarm, *see* Alarm
- Flu, *see* Influenza
- Forecast/forecasting 22, 23, 24, 26, 28, 158
- Gastrointestinal 84, 165, 236
- Generalized linear mixed model 9, 50, 68, 77–94, 158, 231
- Generalized linear model 9, 68, 77–94, 158
- GLM, *see* Generalized linear model
- GLMM, *see* Generalized linear mixed model
- Hidden Markov model (HMM), *see* Markov models
- Influenza 2, 5, 24, 25, 27, 28, 42, 49, 84, 144, 158, 171, 172, 177, 178, 179, 181, 204, 220, 221
- Label switching 212
- Log-linear 8, 26, 29, 51, 68, 162, 227, 230
- Logistic regression model 78, 79, 80, 81, 87, 88, 89, 90, 91, 92, 93, 233
- Lognormal 211, 235
- Markov Chain Monte Carlo (MCMC) 67, 68, 70, 100, 160, 204, 206, 208, 210, 211, 212, 216, 218, 219, 227, 230, 237, 238
- Markov models 10, 27, 28, 42, 204, 206, 207, 210, 211, 213, 214–19
- MEET statistic 134, 136, 137, 146, 147, 151
- Moving average 8, 20–1, 22, 46–7, 164, 180, 182, 183, 184
see also Exponentially weighted moving average (EWMA)
- Network, Bayesian 10, 169, 170, 171, 172, 173, 174, 177, 178, 181, 186, 187, 204
- Neural network 160
- Normal distribution variables 19, 21, 25, 32, 35, 42, 44, 50, 79, 96, 97, 98, 100, 101, 104, 105, 107, 109, 112, 124, 146, 149, 151, 154, 156, 157, 197, 208, 229
- Optimality 8, 9, 31–52, 96, 113, 154, 155, 162, 163
- Overdispersion 26, 45, 65, 66
- Overlap-multiresolution partitioning 193–6, 202
- Plague 2, 3, 18, 131
- Poisson
 - chart – CUSUM 5, 45, 48, 98, 100, 101, 102, 158
 - count 6, 97, 158, 233
 - distribution/likelihood/variables 27, 45, 65, 66, 67, 68, 69, 73, 81, 82, 93, 100, 109, 161, 191, 197, 209, 230, 231, 233
 - model 9, 73, 89, 92, 93, 120, 122, 126, 224, 233
 - point process 32, 35, 43, 45, 63, 70, 73, 102, 118, 191, 224, 227, 229, 233
 - regression 26, 78, 81, 82, 88, 89, 90, 91, 93, 123
- Predictive value – PVP/PVN 8, 14, 36, 39, 42, 52, 163, 234
- Process control 5, 8, 19–22, 23
statistical 5, 9, 23, 32, 40, 95, 96–105, 113

- Random field 229
- Regression 24, 25, 26, 29, 48, 49, 50, 77, 123, 142, 156, 170, 208, 211, 225
 - logistic, *see* Logistic regression model
 - Poisson, *see under* Poisson
- Residual 6, 9, 22, 26, 48, 68–71, 144, 145, 146, 227, 228, 229, 231, 233, 234, 243
- Sampling 14, 173, 217, 231, 240, 241, 242, 243
 - posterior – Gibbs/MCMC 67, 68, 70, 73, 206, 231
- Scan statistics 9, 77, 115–31, 152, 158, 189–202
 - spatial 131, 134, 145, 152, 158, 191–202
 - spatio-temporal/space-time 116–31, 158
- Seasonal/seasonality 5, 22, 25, 26, 27, 28, 49, 85, 113, 142, 143, 144, 171, 172, 173, 177, 178, 179, 181, 204, 206, 208, 220, 221, 232
- Sensitivity 14, 16, 28, 29, 33, 36, 37, 136, 149, 150, 163, 183, 224, 226
- Shewhart
 - chart/control chart/control table 3, 8, 19–20, 21, 23, 95, 96–105
 - method 43, 44, 47, 49, 156, 157, 158, 159, 160
- Smallpox 3
- Specificity 16, 28, 29, 33, 36, 149, 150, 163, 183
- Statistical process control, *see* Process control
- Surveillance, multivariate 9, 33, 50, 51, 111, 153–66, 170, 221
 - on-line 3, 32, 33, 51
 - spatial 1–2, 3–4, 6, 7, 9, 31, 32, 46, 51, 52, 63, 95–114, 151, 153, 157, 161
 - spatio-temporal 6, 75, 133, 141–7, 240
 - syndromic 1, 2, 16, 36, 50, 75, 116, 153, 159, 163, 165, 223, 234, 236, 243
 - temporal 6, 7, 8, 10, 13–29, 96, 133, 142, 144
- Time series 5, 8, 15, 22–9, 31, 35, 94, 142, 143, 144, 146, 156, 158, 170, 206, 212, 238
- Vector accumulation 9, 51, 155, 159, 160–1, 163, 165
- Veterinary medicine 9, 127, 130–1
- Viral hemorrhagic fever 3
- West Nile virus 116, 129, 130, 171

