
Author index

- Aalen, O.O., 42, 97, 98, 172, 317
 Adler, R.J., 253, 317
 Aggoun, L., 319
 Agresti, A., 124, 317
 Aickin, M., 155, 317
 Aisbett, C.W., 100, 323
 Aitkin, M.A., 35, 317
 Akaike, H., 16, 317
 Albert, P.S., 207, 317, 325
 Altham, P.M.E., 157, 317
 Andersen, P.K., 93, 208, 317
 Anderson, D., 317
 Anderson, D.R., 16, 318
 Anderson, R.M., 296, 317
 Anderson, W.J., 145, 317
 Andrews, D.F., 94, 176, 231, 317
 Anscombe, F.J., 153, 317
- Bailey, N.T.J., 16, 124, 253, 317
 Banks, R.B., 279, 281–283, 317
 Bartholomew, D.J., xi, 317
 Bartlett, M.S., 16, 79, 84, 103, 317
 Baskerville, J.C., 208, 209, 317
 Baum, L.E., 161, 318
 Berg, H.C., 93, 108, 124, 253, 318
 Berger, M.P.F., 324
 Bishop, Y.M.M., 120, 129, 318
 Blair, D.C., 324
 Bloomfield, P., 229, 230, 318
 Boadi-Boateng, F., 257, 321
 Borgan, O., 317
 Box, G.E.P., 314, 318
 Brauer, F., 279, 318
 Bremaud, P., 107, 124, 145, 318
 Brockwell, P.J., 230, 318
 Brown, J.H., 279, 318
 Buckle, D.J., 243, 318
 Burnham, K.P., 16, 318
 Burr, I.W., 171, 318
 Bye, B.V., 180, 318
- Cameron, M.A., 228, 318
 Carstensen, B., 68, 70, 318
 Castillo-Chavez, C., 279, 318
 Chatfield, C., 230, 318
 Chiang, C.L., 16, 318
 Churchill, G.A., 163, 180, 318
 Ciminera, J.L., 308, 318
 Cislak, P.J., 171, 318
 Clayton, D.G., 147, 172, 318
 Cohen, J.E., 105, 318
- Collett, D., 66, 318
 Conaway, M.R., 128, 318
 Conroy, M.J., 323
 Cox, D.R., 8, 9, 16, 48–50, 66, 77, 79–81, 93, 107, 131, 198, 199, 206, 318, 319
 Crouchley, R., 126, 319
 Crowder, M.J., 172, 265, 313, 319, 320
 Cumberland, W.G., 324
- Daley, D.J., 9, 45, 77, 319
 Daly, F., 320
 Davidian, M., 297, 319
 Davies, R.B., 319
 Davis, R.A., 230, 318
 Davison, A.C., 164, 319
 de Angelis, D., 282, 319
 De Stavola, B.L., 150, 319
 Dellaportas, P., 64, 65, 319
 Derman, C., 124, 319
 Diaconis, P., 305, 319
 Diggle, P.J., 181, 215, 230, 284, 319
 Dinse, G.E., 68, 319
 Dobson, A.J., 35, 319
 Doob, J.L., 16, 124, 319
 Duncan, O.D., 129, 319
 Durbin, J., 180, 264, 319
 Durbin, R., 180, 319
- Eddy, S., 319
 Efron, B., 158, 319
 Elliott, R.J., 180, 319
 Ellis, W.C., 323
 Elston, R.C., 311, 314, 315, 319
 Engle, R.F., 249, 319
 Ewens, W.J., 16, 320
- Faddy, M.J., 190, 191, 290–292, 320
 Fahrmeir, L., 264, 320
 Feigin, P.D., 192, 320
 Feigl, P., 67, 320
 Feldman, R.E., 317
 Feller, W., 16, 93, 124, 320
 Fenlon, J.S., 190, 191, 320
 Fienberg, S.E., 318
 Finch, P.D., 105, 320
 Fingleton, B., 123, 124, 130, 131, 320, 324
 Finkelstein, D.M., 54, 57, 320
 Fitzmaurice, G.M., 125, 320
 Francis, B., 317
- Gamerman, D., 67, 320

- Gardiner, C.W., 238, 239, 253, 320
 Gehan, E.A., 51, 320
 Gibaldi, M., 295, 320
 Gilks, W.R., 282, 319
 Gill, R.D., 317
 Giltinan, D.M., 297, 319
 Gleser, L.J., 319
 Goodman, L.A., 116, 118, 320
 Grandell, J., 16, 320
 Grant, G.R., 16, 320
 Grever, M.R., 322
 Grimmett, G.R., 16, 93, 106, 124, 136, 137, 253, 320
 Grizzle, J.F., 311, 314, 315, 319
 Gutfreund, H., 295, 320
 Guttorp, P., 16, 85, 93, 180, 196, 234, 253, 320
- Hamilton, J.D., 180, 320
 Hand, D.J., 231, 313, 320
 Harrison, J., 180, 324
 Harrison, P.J., 325
 Harvey, A.C., 180, 230, 264, 320
 Hay, J.W., 283, 320
 Healy, M.J.R., 276, 282, 320
 Heckman, J.J., 127, 321
 Henderson, R., 210, 321
 Herzberg, A.M., 94, 176, 231, 317
 Hinde, J., 317
 Hoffmann-Jørgensen, J., 242, 321
 Holland, P.W., 318
 Homer, L.D., 324
 Honerkamp, J., 322
 Hoppensteadt, F.C., 253, 321
 Hsu, D.A., 96, 254, 321
 Hughes, T.H., 300, 321
 Husebye, E., 42, 98, 172, 317
- Iosifescu, M., 124, 137, 145, 321
 Isham, V., 77, 80, 93, 199, 206, 319
- Janacek, G., 230, 321
 Jarrett, R.G., 204, 321
 Jennings, B., 317
 Joe, H., 16, 129, 132, 321
 Jones, B., 313, 321
 Jones, P.W., 16, 321
 Jones, R.H., 257, 264, 266, 313, 321
 Jørgensen, B., 193, 321
 Jørgensen, M., 185, 321
 Juang, B.H., 180, 321
- Kalbfleisch, J.D., 66, 146, 299, 321
 Kalbfleisch, J.G., 187, 321
 Kaplan, E.L., 47, 321
 Karlin, S., 16, 93, 124, 145, 196, 253, 322
 Karr, A.F., 16, 93, 180, 206, 322
 Keene, O.N., 36, 322
 Keiding, N., 317, 321
 Kein, S., 180, 322
 Kendall, M.G., 230, 322
 Kenward, M.G., 313, 321
 Kiffe, T.R., 296, 323
 Kingman, J.F.C., 93, 206, 322
 Kitagawa, G., 264, 322
 Klein, J.P., 61, 66, 143, 322
 Klotz, J.H., 109, 322
 Kodell, R.L., 294, 322
 Koopman, S.J., 180, 264, 319
 Kopecky, K.J., 323
 Kotz, S., 247, 322
- Kozubowski, T.J., 322
 Kramer, W., 232, 322
 Krogh, A., 319
 Küchler, U., 16, 192, 322
- Lachin, J.M., 149, 324
 Laird, N.M., 125, 311, 320, 322
 Law, N., 239, 324
 Lawal, H.B., 122, 322
 Lawless, J.F., 66, 97, 146, 321, 322
 Lawrance, A.J., 13, 322
 Leroux, B.G., 182, 322
 Lewis, P.A.W., 13, 50, 81, 93, 131, 319, 322
 Liang, K.Y., 325
 Lindsey, J.K., xi, 16, 18, 35, 47, 53, 75, 114, 124, 180, 262, 279, 295, 310, 313, 314, 322, 323
 Lunn, A.D., 320
- MacDonald, I.L., 16, 165, 180, 323
 Maguire, B.A., 95, 200, 323
 Marshall, A.W., 82, 323
 Marubini, E., 66, 323
 Matis, J.H., 292, 294, 296, 300, 301, 321–323
 Matthews, D.E., 148, 323
 Matthews, J.N.S., 210, 321
 May, R.M., 296, 317, 323
 Mazza, J., 317
 McConway, K.J., 320
 McCullagh, P., 35, 323
 McGilchrist, C.A., 100, 280, 323, 324
 Meier, P., 47, 321
 Meyn, S.P., 230, 323
 Migon, H.S., 325
 Miller, H.D., 8, 9, 16, 107, 319
 Miller, M.L., 16, 93, 206, 324
 Mitchison, G., 319
 Moeschberger, M.L., 66, 322
 Monroe, R.J., 324
 Moore, J.B., 319
 Morris, C.N., 305, 323
- Nadeau, C., 97, 322
 Nelder, J.A., 35, 323
 Nelson, W., 97, 323
 Notari, R.E., 295, 298, 323
 Nowak, M.A., 296, 323
- Oakes, D., 49, 66, 319
 Oliver, F.R., 271, 323
 Olkin, I., 319
 Ord, J.K., 230, 322
 Ostrowski, E., 320
 Ouwens, M.J.N., 324
- Parzen, E., 232, 323
 Pearson, E.S., 323
 Perrier, D., 295, 320
 Peskin, C.S., 253, 321
 Petrie, T.A., 161, 318
 Pickles, A.R., 319
 Pierce, D.A., 69, 70, 323
 Podgórski, K., 322
 Pollock, K.H., 69, 323
 Potthoff, R.F., 314, 315, 323
 Prentice, R.L., 66, 321
 Priestley, M.B., 230, 323
 Proschan, F., 77, 82, 99, 323
 Puterman, M.L., 182, 322
- Rabiner, L.R., 180, 321, 323

- Ramesh, N.I., 164, 319
 Raz, J., 250, 324
 Rogers, L.C.G., 253, 324
 Ross, S.M., 16, 145, 324
 Roy, S.N., 314, 315, 323
 Royston, P., 281, 324

 Sakkebak, N.E., 321
 Sakmar, E., 324
 Samorodnitsky, G., 253, 324
 Sandland, R.L., 280, 324
 Scallan, C.V., 273, 324
 Schechter, E.S., 180, 318
 Schmidt, P., 57, 324
 Senn, S., 314, 324
 Seshradi, V., 181, 324
 Shephard, N., 250, 253, 324
 Smith, A.F.M., 319
 Smith, P., 16, 321
 Smith, R.L., 172, 174, 324
 Smith, W.L., 80, 324
 Snyder, D.L., 16, 93, 206, 324
 Sonnberger, H., 232, 322
 Sørensen, M., 16, 192, 322
 Stavropoulos, P., 319
 Stewart, W.H., 323
 Still, R.G., 324
 Stürzaker, D.R., 16, 93, 106, 124, 136, 137, 253, 320
 Sullivan, T.J., 297, 324
 Swift, L., 230, 321
 Sy, J.P., 324

 Tan, F.E.S., 316, 324
 Taqqu, M.S., 253, 317, 324
 Taylor, H.M., 16, 93, 124, 145, 196, 253, 322
 Taylor, J.M.G., 239, 324
 Thompson, S.G., 281, 324
 Thompson, W.A., 16, 81, 324
 Tijms, H.C., 137, 145, 324

 Tillett, H.E., 276, 282, 320
 Timmer, J., 322
 Toogood, J.H., 317
 Turner, M.E., 302, 324
 Turner, T.R., 228, 318
 Tutz, G., 264, 320
 Tweedie, R.L., 230, 323

 Upton, G.J.G., 122, 130, 322, 324

 Valsecchi, M.G., 66, 323
 Vere-Jones, D., 9, 45, 77, 319
 Vollmer, W.M., 321

 Wagner, J.G., 324
 Ware, J.H., 311, 322
 Wehrly, T.E., 323
 Wei, L.J., 149, 324
 Weng, T.S., 140, 141, 324
 West, G.B., 279, 318
 West, M., 180, 264, 324, 325
 Whitmore, G.A., 236, 238, 325
 Williams, D., 253, 324
 Willis, R.J., 127, 321
 Winterstein, S.R., 323
 Witte, A.O., 57, 324
 Wolak, F.A., 283, 320
 Wolfe, E.K., 308, 318
 Wolfe, R.A., 54, 57, 320
 Wolff, R.W., 81, 106, 145, 325
 Wynn, A.H.A., 323

 Yafune, A., 298, 325
 Ylvisaker, D., 305, 319

 Zeger, S.L., 95, 304, 325
 Zelen, M., 67, 320
 Zucchini, W., 16, 165, 180, 323

Subject index

- absorbing barrier, 75, 108, 133
- absorbing class, 105, 107
- absorbing state, 40–41, 60, 64, 105, 107, 133, 134, 136–138, 142, 205
- absorption rate, 287, 288
- accelerated failure times, 49
- accessible state, 104
- ACF, 214–216, 218–219
- AIC, 16, 24
- Akaike information criterion, 16, 24
- algorithm
 - Baum–Welch, 164
 - EM, 164
 - optimisation
 - nonlinear, 203
 - Viterbi, 164
- aligned time, 43
- allometry, 269, 278
- alternating Poisson process, 134, 199
- amplitude, 227
- analysis of covariance, 28
- analysis of variance, 26–27
- apparent volume of distribution, 289
- $AR(M)$, 216, 218, 228–229, 256
- $AR(M, 0)$, 216
- $AR(M, 0, 0)$, 216
- $AR(M, 1, 0)$, 216
- $AR(1)$, 216–225, 237–239, 252, 256–258, 262, 271–275, 279, 306–307, 312
- ARCH model, 161, 249–252
- arithmetic mean, 221, 270
- arrival time, 71, 73, 74, 78
- asymptote, 269, 272, 273, 275, 277, 278
- asymptotic statistics, *x*, 80
- autocorrelation function, 214–216, 218–219
 - Cauchy, 219
 - exponential, 218
 - gamma, 192
 - Gaussian, 219
 - partial, 215–216
 - spherical, 219
- autocovariance, 214, 227
- autointensity function, 85–87, 214
- autoregression, 12–13, 191–194, 216–224, 228–229, 256–257
 - continuous, 218, 257–259
- backward recurrence time, 81
- bandwidth, 85
- barrier
 - absorbing, 75, 108, 133
 - reflecting, 108, 121, 289
- baseline constraint, 26–27
- baseline intensity, 48–50
- bathtub intensity function, 51
- Baum–Welch algorithm, 164
- Bayes' formula, 163, 257
- beta-binomial distribution, 64–66, 157
- beta distribution, 293–295
- bias, 42, 43
- binary point process, 71–93, 108–114
- binomial distribution, 6, 29, 47, 64, 90, 108, 157
 - double, 158
 - multiplicative, 157–158
- birth and death process, 108
- birth intensity, 74
 - nonhomogeneous, 74
- birth process, 13–14, 71, 79, 93, 175, 177–178, 183–190, 194, 202
 - doubly stochastic, 202
 - linear, 78, 143
 - nonhomogeneous, 74
 - pure, 74, 143
- boundary conditions, 108
- boundary value, 234
- Brownian motion, 194, 233, 234, 238, 239
- Burr distribution, 170–171, 199–202, 246, 260–262
- Burr renewal process, 176–177
- canonical link function, 30, 188, 305
- canonical parameter, 305
- CAR(1), 218, 257
- carry-over effect, 36, 308
- carrying capacity, 273
- Cauchy autocorrelation, 219
- Cauchy distribution, 233, 242, 246
- censoring, 40, 42–43, 45–66, 83, 172, 196–198, 200
 - failure, 42
 - interval, 53–58, 60
 - right, 47–53
 - time, 42
 - Type I, 42, 44
 - Type II, 42
- central limit theorem, 241
- change point, 202–206
- chaos, 6
- Chapman–Kolmogorov equation, 104, 165, 234, 238
- characteristic function, 241–243
- Cholesky decomposition, 218
- Chow test, 213
- chronological time, 43
- class

- absorbing, 105, 107
- closed, 105
 - communicating, 104, 106, 107, 135
- clinical trial, 43–45, 48, 51–53, 139–142, 175–178
- closed class, 105
- clustered point process, 165–167
- clustering, 155–157
 - events, 79, 82, 106, 110, 161, 165–167
 - extreme values, 240–252
- coarsening, 164
- coefficient of dispersion, 82, 91
- coefficient of variation, 30, 82, 91, 271
- communicating class, 104, 106, 107, 135
- compartment
 - sink, 285
 - source, 285
- compartment model, 285–295
 - first-order, 287–289
 - zero-order, 292–293
- compensator, 73
- competing risks, 42, 134
- complementary log log link function, 157–158, 278
- compound Poisson process, 195–196
- concentration matrix, 218
- conditional distribution, 7–8, 10–14, 19, 102
- conditional exponential family, 192–194
- confined exponential function, 272–275
- conjugate distribution, 170, 305
 - mixing, 305
- constraint
 - baseline, 26–27
 - conventional, 27
 - mean, 27
- contagion process, 78, 183–190
- contingency table, 101, 109–124
- continuous autoregression, 218, 257–259
- continuous time, 12, 164, 218
- conventional constraint, 27
- convolution, 193
- correlogram, 214–216, 245, 246, 250, 251
- count update, 174, 177–178, 180
- counting process, 72–76
- covariance matrix, 216–218, 257–258
- covariate
 - time-varying, 10, 12
 - endogenous, 5, 46, 74
 - exogenous, 5, 79
- cross-over design, 308–311, 313
- cumulated update, 174
- cumulative event plot, 84–85
- data
 - Abbey National returns, 243–246, 248–249
 - accidents
 - mine, 95, 127–128, 182, 200–206, 210
 - nuclear, 125, 128, 146
 - addiction, 139–142
 - AIDS
 - UK, 276, 278, 282
 - USA, 282–283
 - aircraft, 99, 182
 - air-conditioning, 98–99
 - arrivals, 95–96
 - animal learning, 155–158, 206–207
 - baboons, 208
 - bean leaf growth, 273–275, 279
 - birch bugs, 298–299
 - black ducks, 68–69
 - bladder cancer, 176–178, 193–194
 - blood pressure, 122
 - blood sugar, 308
 - breast cancer, 53–57
 - buprenorphine, 139–142
 - cancer
 - bladder, 176–178, 193–194
 - breast, 53–57, 147–148, 150
 - gastric, 67–68
 - leukæmia, 51–53, 61–64, 66–67, 143–147
 - lymphoma, 68, 147
 - capital formation, 271–272
 - cows, 299–301
 - lutein, 250–252, 259–264, 306–307, 312–313
 - deaths
 - bronchitis, 181, 213–216, 219–221, 227–228, 230, 265
 - horse kicks, 94–95
 - human, 65–66
 - Declomycin, 296–298
 - dialysis, 99–100, 182
 - dissolved oxygen, 281
 - divorces, 18–21, 23–28, 30–35
 - dog learning, 186–188
 - Dow-Jones, 254
 - ephedrine, 296, 298
 - fish toxicity, 69–70
 - flies mating, 96–97
 - gallstones, 147, 149
 - gastric cancer, 67–68
 - gastric half-emptying, 35–36
 - gentamicin, 290–291, 293
 - glucose, 280–281
 - grass marker, 299–300
 - growth
 - bean leaf, 273–275, 279
 - girls, 316–317
 - pika, 280
 - rats, 314
 - sunflowers, 280
 - hæmolytic uræmia, 209–210
 - HIV, 68–70
 - horse kicks, 94–95
 - indomethicin, 296–297
 - intensive care, 128, 131
 - kidney infection, 99–100, 182
 - lambs, 181–182
 - learning
 - animal, 155–158, 206–207
 - dog, 186–188
 - leukæmia, 51–53, 146–147
 - myeloid, 61–64, 66–67, 143–145
 - nonlymphoblastic, 147
 - locusts, 165–167
 - lutein
 - cows, 250–252, 259–264, 306–307, 312–313
 - lymphoma, 68
 - lynx, 230–231, 253
 - migration
 - British companies, 127, 130
 - UK, 123–124
 - Wisconsin, 124, 126
 - mine accidents, 95, 127–128, 182, 200–206, 210
 - mortality
 - bronchitis, 181, 213–216, 219–221, 227–228, 230, 265
 - horse kicks, 94–95
 - human, 65–66
 - motility, 98, 182
 - mouse disease, 207–208

- nematodes, 190–191
oxygen
 biochemical demand, 281–282
 dissolved, 281
Paramecium, 283
pharmacokinetics
 Declomycin, 296–298
 ephedrine, 296, 298
 gentamicin, 290–291, 293
 indomethacin, 296–297
 prednisolone, 296–297
pika growth, 280
poliomyelitis, 95
precipitation
 Buffalo, 232, 254
 Madison, 109–114
 Snoqualmie Falls, 196–198, 207, 254
prednisolone, 296–297
preference trial, 208–209
pterygomaxillary fissure, 314–316
rabbits, 308–310
rainfall, 109–114
ramus height, 314–315
ranchers, 282–283
rat reactions, 265–266
recidivism, 57–60
renogram, 300, 302
road traffic, 84–87, 89, 91–93, 182
sheep, 290–291, 293
smoking
 children, 146
snowfall, 232, 254
social mobility
 Denmark, 126, 129
 Great Britain, 120–121, 126
spermarche, 184–185
straw marker, 300–301
sulphate metabolism, 294–296
sunflower growth, 280
sunspots, 231, 253
survival
 black ducks, 68–69
 gastric cancer, 67–68
 leukæmia, 51–53, 66–67
 lymphoma, 68
systemic lupus erythematosus, 266–267
toxicity
 fish, 69–70
transistor gains, 236–240
tumour recurrence, 176–178, 193–194
unemployment
 USA, 231–232, 253
urinary infections, 128–130, 132
valves, 97–98, 182
vehicles, 84–87, 89, 91–93, 182
votes
 Sweden, 127, 130, 131, 146
 USA, 115–119
weather
 USA, 196–198, 207, 254
wheezing, 124–125
whooping cranes, 180–181
women working, 125, 127
Yale enrolment, 152–153, 158, 161, 179–180,
 223–225, 229–230, 253, 265, 280
dependence, 10–14
descriptive statistics, 18–21, 83–87, 213–216
design
 cross-over, 308–311, 313
 factorial, 155–157
 panel, 115
 prospective, 43–45
 retrospective, 18, 43
deterministic process, 6
diagonal symmetry, 121
differential equation, 218, 234, 268, 285–288
diffusion process, 12, 233–252, 289–293
 integrated Ornstein–Uhlenbeck, 219, 239
 Ornstein–Uhlenbeck, 238–240
 Wiener, 194, 224, 233–240
discrete time, 12, 101–124
distribution
 beta, 293–295
 beta-binomial, 64–66, 157
 binomial, 6, 29, 47, 64, 90, 108, 157
 double, 158
 multiplicative, 157–158
 Burr, 170–171, 199–202, 246, 260–262
 Cauchy, 233, 242, 246
 conditional, 7–8, 10–14, 19, 102
 conjugate, 170, 305
 mixing, 305
 double binomial, 158
 exponential, 29–30, 48, 50–60, 76–77, 81, 82, 87,
 91–93, 105, 134–137, 198, 203–206, 228, 286,
 291–293
 unit, 46, 78, 170
 finite mixture, 57–60, 163, 196–198
 first passage, 106
 gamma, 29–33, 47, 50–60, 77, 91–93, 192–194,
 196–198, 228, 260–262, 270, 271, 290–295
 generalised, 50–53
 mixing, 90, 169–180, 199–202, 260
 geometric, 105–106, 134, 197
 heavy-tailed, 240–252
 inverse Gauss, 29, 32, 50–60, 196–198, 234,
 260–262
 Laplace, 233, 246
 skew, 247–249
 Lévy, 242
 limiting, 104
 log Burr, 250–252
 log Cauchy, 33, 50–60, 196–198
 log Laplace, 33, 50–60, 196–198
 log logistic, 33, 49–60, 74, 87, 91–93, 196–198,
 270
 log normal, 32, 49–60, 87, 91–93, 196–198,
 250–252, 260–264, 270–275, 290–291,
 294–295
 log power exponential, 250–252, 260–262
 log skew Laplace, 250–252, 260–262
 log Student *t*, 250–252, 260–262
 logistic, 246, 270
 marginal, 7, 8, 10, 13, 102, 304–306
 stationary, 103, 105, 107, 115, 119, 137, 162
 mixing, 304, 305
 conjugate, 305
 gamma, 90, 169–180, 199–202, 260
 mixture, 163, 257, 303–306
 finite, 57–60, 163, 196–198
 multiplicative binomial, 157–158
 multivariate, 10–11, 303–306
 negative binomial, 79, 90–91, 157–158, 161,
 179–180, 189, 223
 normal, 6, 10, 18–29, 194, 233, 255–259, 270–275,
 294–295
 multivariate, 7, 8, 213–230, 234–240, 303–313
 Pareto, 169, 171, 196–198

- Poisson, 6, 29, 61, 64, 75–76, 152–153, 157, 203, 223
 power exponential, 247
 simplex, 293–295
 stable, 241–246
 Student t , 233, 247
 Weibull, 32, 47–60, 74, 91–93, 170–171, 196–202, 260–262
- domain of attraction, 241
 double binomial distribution, 158
 doubly stochastic point process, 79, 198–202
 doubly stochastic Poisson process, 199
 doubly stochastic renewal process, 199–202
 drift, 108, 121, 122, 223, 234, 236, 238
 dropout, 41–42
 nonrandom, 138–142
 dummy variable, *see* indicator variable
 duration, 39–66, 71–76
 Durbin–Watson test, 213
 dynamic linear model, 255–259
 dynamic model, 151–180, 255–264
- eigenvalue, 104, 106, 136
 eigenvector, 104, 136
 elementary renewal theorem, 80, 107
 elimination rate, 287, 288
 exponential, 291
 EM algorithm, 164
 endogenous covariate, 5, 46, 74
 equilibrium, 8, 81, 104, 106, 119–121
 ergodic Markov chain, 103, 107
 ergodic state, 107
 ergodic theorem, 8
 ergodicity, 8–9
 evaluation problem, 162
 event, 3
 point, 5
 recurrent, 5, 9, 13, 71–93, 133, 134
 repeated, *see* recurrent
 event clustering, 79, 82, 106, 110, 161, 165–167
 event history, 133–145
 event update, 175
 excess lifetime, 81
 exogenous covariate, 5, 79
 explanatory variable, *see* covariate
 exponential autocorrelation, 218
 exponential dispersion family, 193–194, 234, 305
 exponential distribution, 29–30, 48, 50–60, 76–77, 81, 82, 87, 91–93, 105, 134–137, 198, 203–206, 228, 286, 291–293
 unit, 46, 78, 170
 exponential family, 191, 305
 exponential growth curve, 269–272, 278
 exponential intensity, 50, 61–64, 141–145
 exponential survivor function, 50, 77
 extreme values clustering, 240–252
- factor variable, 26
 factorial design, 155–157
 failure censoring, 42
 failure rate, 45
 failure types, 82
 family
 exponential, 191, 305
 conditional, 192–194
 exponential dispersion, 193–194, 234, 305
 location-scale, 233
 stable, 241–246
 filter, 227
- Kalman, 217, 255–259
 filtering update, 163, 173, 257, 258
 filtration, 72
 finite mixture, 57–60, 163, 196–198
 first passage distribution, 106
 first passage time, 106
 first-order kinetics, 285–289
 forward differential equation, 189
 forward recurrence probability, 164
 forward recurrence time, 81
 Fourier analysis, 226
 Fourier frequencies, 226
 Fourier transform, 243
 frailty model, 171–172, 175–177, 201–202, 303, 304, 312–313
 frailty update, 171–172, 179, 312
 frequency, 227
 frequency domain, 226
 function
 autointensity, 85–87
 confined exponential, 272–275
 exponential, 269–272, 278
 Gompertz, 277–278
 indicator, 75, 184
 likelihood, 15–16, 23–24, 46–47, 75–76, 162–164, 173, 203
 normed, 203–205
 profile, 56–57
 link, 29, 34
 canonical, 30, 188, 305
 complementary log log, 157–158, 278
 identity, 30–32, 34, 193, 270
 log, 51, 167, 188, 193, 229, 270
 log log, 157–158, 277
 logit, 157–158, 167, 188, 275
 reciprocal, 30–31
 logistic, 34, 275–276, 278
 Mitscherlich, 272–275
 monomolecular, 272–275, 278
 rate, 72
 Richards, 278–279
 sigmoidal, 275–278
 von Bertalanffy, 273
 fundamental frequencies, 226
 fundamental matrix, 107
- gamma distribution, 29–33, 47, 50–60, 77, 91–93, 192–194, 196–198, 228, 260–262, 270, 271, 290–295
 generalised, 50–53
 mixing, 199, 201, 202, 260
 gamma intensity, 50, 61–64, 144–145
 gamma mixture distribution, 90, 169–180, 199–202
 gamma process, 194
 Gaussian autocorrelation, 219
 generalised gamma distribution, 50–53
 generalised linear model, 24, 29–32, 229, 249, 275
 geometric distribution, 105–106, 134, 197
 geometric mean, 220, 270
 Gompertz growth curve, 277–278
 complementary, 277–278
 graphics, 19–21, 83–87, 213–216
 grid search, 203
 growth curve, 268–279
 exponential, 269–272, 278
 Gompertz, 277–278
 complementary, 277–278
 logistic, 34, 275–276, 278
 Richards, 278–279

- sigmoidal, 275–278
- von Bertalanffy, 273
- hazard function, 45
- heavy-tailed distribution, 240–252
- heterogeneity, 64, 158, 172, 175–177, 304, 307, 312
- heteroscedasticity, 159–161, 224–225, 249
- hidden Markov chain, 151, 161–167, 205–206, 259–263
- hidden state, 5, 161–180, 205–206, 259–262
- histogram, 19–20, 84–86
- hitting time, 106
- homogeneity, 102–108, 115–117, 141–142
- hypergeometric function
 - incomplete, 242
- identity link function, 30–32, 34, 193, 270
- incidence, 61
- incomplete data, 41–42
- increments
 - independent, 73, 76, 194, 196, 223, 234
 - stationary, 73, 76, 194, 196, 269
- independent and identically distributed, 71, 80, 83, 91, 195, 197
- independent increments, 73, 76, 194, 196, 223, 234
- independent variable, *see* covariate
- indicator function, 46, 75, 184
- indicator variable, 26–27
- inference
 - likelihood, 15–16, 23–24
- initial conditions, 6, 8, 11, 14, 15, 74, 103, 152, 155, 171, 174, 189, 193, 234, 235, 238, 257, 258, 269, 273, 286, 288
- innovations, 13, 73, 217, 225, 249, 256, 269
- inspection paradox, 81
- integrated intensity, 45–46, 60, 61, 73, 75, 78, 80, 82, 167, 170
- integrated Ornstein–Uhlenbeck diffusion process, 219, 239
- intensity
 - transition, 189
- intensity function, 40, 45–46, 50–53, 60–64, 72–76
 - baseline, 48–50
 - bath tub, 51
 - birth, 74
 - nonhomogeneous, 74
 - exponential, 50, 61–64, 141–145
 - gamma, 50, 61–64, 144–145
 - integrated, 45–46, 60, 61, 73, 75, 78, 80, 82, 167, 170
 - inverse Gauss, 50
 - log Cauchy, 50, 61–64, 144–145
 - log Laplace, 50
 - log logistic, 50, 61–64, 144–145
 - log normal, 50, 61–64, 144–145
 - Markov renewal, 74
 - multiplicative, 48–49
 - Poisson, 73
 - nonhomogeneous, 73
 - renewal, 74, 80–81
 - transition, 72, 134, 164, 261
 - Weibull, 50, 61–64, 144–145
- intensity transition matrix, 136–145
- interaction, 25, 28
- interarrival time, 71, 73, 74, 76, 78–83, 87, 93, 108, 199, 203
- intercept, 22
 - random, 305
- interval censoring, 53–58, 60
- intraclass correlation, 310
- intrinsic growth coefficient, 270
- inverse Gauss distribution, 29, 32, 50–60, 196–198, 234, 260–262
- inverse Gauss intensity, 50
- irreducible Markov chain, 104–107, 135, 139, 162
- Kalman filter, 217, 255–259
- Kalman smoother, 217, 255–259
- Kalman update, 174
- Kaplan–Meier estimate, 47, 51–56, 58, 61–63, 84, 87–88, 91, 143–145, 176
- kinetics, 273, 286
 - first-order, 285–289
- Kolmogorov forward differential equation, 189
- lag, 12, 112, 113, 193, 214, 216, 223
- Laplace distribution, 233, 246
 - skew, 247–249
- Laplace transform, 170
- law of large numbers, 9
- learning process, 186–188
- Lévy distribution, 242
- lifetime
 - excess, 81
 - residual, 81
- likelihood function, 15–16, 23–24, 46–47, 75–76, 162–164, 173, 203, 235–236, 257–258
 - normed, 203–205
 - profile, 56–57
- likelihood inference, 15–16, 23–24
- limiting distribution, 104
- linear birth process, 78, 143
- linear model, 21–28
 - dynamic, 255–259
 - generalised, 24, 29–32, 229, 249, 275
- linear regression, 21–25
 - multiple, 24–25
- link function, 29, 34
 - canonical, 30, 188, 305
 - complementary log log, 157–158, 278
 - identity, 30–32, 34, 193, 270
 - log, 51, 167, 188, 193, 229, 270
 - log log, 157–158, 277
 - logit, 157–158, 167, 188, 275
 - reciprocal, 30–31
- location-scale family, 233
- log Burr distribution, 250–252
- log Cauchy distribution, 33, 50–60, 196–198
- log Cauchy intensity, 50, 61–64, 144–145
- log Laplace distribution, 33, 50–60, 196–198
- log Laplace intensity, 50
- log linear model, 75, 113–124
- log link function, 51, 167, 188, 193, 229, 270
- log log link function, 157–158, 277
- log logistic distribution, 33, 49–60, 74, 87, 91–93, 196–198, 270
- log logistic function, 63
- log logistic intensity, 50, 61–64, 144–145
- log logistic survivor function, 50
- log normal distribution, 32, 49–60, 87, 91–93, 196–198, 250–252, 260–264, 270–275, 290–291, 294–295
- log normal intensity, 50, 61–64, 144–145
- log normal renewal process, 176–177
- log power exponential distribution, 250–252, 260–262
- log skew Laplace distribution, 250–252, 260–262
- log Student *t* distribution, 250–252, 260–262
- logistic distribution, 246, 270

- logistic growth curve, 34, 275–276, 278
 logistic regression, 101, 108, 109, 111–114, 184–185, 196
 logit link function, 157–158, 167, 188, 275
 marginal distribution, 7, 8, 10, 13, 102, 304–306
 stationary, 103, 105, 107, 115, 119, 137, 162
 marginal homogeneity, 119
 marginal profile, 102, 151, 259
 mark, 5
 mark–accumulator process, 195, 196
 marked point process, 73, 79, 195–198
 Markov chain, 11, 101–124, 151, 167, 196–198
 aperiodic, 106–107
 continuous-state, 191
 continuous-time, 134–142, 286
 embedded, 137, 139, 141, 143
 ergodic, 103, 107
 first-order, 115–117
 hidden, 151, 161–167, 205–206, 259–263
 irreducible, 104–107, 135, 139, 162
 periodic, 106–107
 second-order, 118–119
 Markov process, 11–12
 Markov renewal intensity, 74
 Markov renewal process, 74, 137–138, 144–145
 Markov update, 175, 177, 178, 262
 Markovian transition probability, 134
 martingale, 73
 mass balance equations, 285
 matrix
 covariance, 216–218, 257–258
 transition
 homogeneous, 102–108, 115–117, 141–142
 intensity, 136–145
 probability, 102–124, 136
 matrix exponentiation, 136–137, 141, 143, 164, 190, 262, 286, 288
 mean
 arithmetic, 221, 270
 geometric, 220, 270
 mean constraint, 27
 mean recurrence time, 107
 measurement equation, 162, 173, 255–257
 measurement error, 80, 234–238, 287, 290
 mechanistic model, 187–188, 268–279, 285–295
 memoryless process, 77
 Mitscherlich function, 272–275
 mixed Poisson process, 199
 mixing distribution, 304, 305
 conjugate, 305
 gamma, 199, 201, 202
 mixture distribution, 163, 257, 303–306
 finite, 57–60, 163, 196–198
 gamma, 90, 169–180, 199–202
 model
 analysis of covariance, 28
 analysis of variance, 26–27
 ARCH, 161, 249–252
 change-point, 202–206
 compartment, 285–295
 first-order, 287–289
 zero-order, 292–293
 diagonal symmetry, 121
 dynamic, 151–180, 255–264
 frailty, 171–172, 175–177, 201–202, 303, 304, 312–313
 generalised linear, 24, 29–32, 229, 249, 275
 linear, 21–28
 dynamic, 255–259
 generalised, 24, 29–32, 229, 249, 275
 linear regression, 21–25
 multiple, 24–25
 log linear, 75, 113–124
 logistic regression, 101, 108, 109, 111–114, 184–185, 196
 marginal homogeneity, 119
 mechanistic, 187–188, 268–279, 285–295
 mover–stayer, 122–124
 moving average, 216
 nonlinear regression, 34
 Poisson regression, 89
 population-averaged, 304, 305
 progressive, 133, 134, 142–145
 quasi-independence, 122–124
 quasi-symmetry, 119
 random coefficients, 310–313
 random effect, 171–172, 239, 303–306
 regression
 linear, 21–25
 logistic, 101, 108, 109, 111–114, 184–185, 196
 multiple, 24–25
 nonlinear, 34
 Poisson, 89
 saturated, 47, 65, 114, 117, 119, 121–123, 309
 serial dependence, 12–13, 152–158, 160
 series-specific, 304
 state dependence, 12, 45, 61, 75, 166
 symmetry, 119
 volatility, 171, 233–252, 262
 monomolecular function, 272–275, 278
 mortality rate, 45
 mover–stayer model, 122–124
 moving average, 216
 multiplicative binomial distribution, 157–158
 multiplicative intensities, 48–49
 multivariate distribution, 10–11, 303–306
 multivariate normal distribution, 7, 213–230, 234–240, 303–313
 negative binomial distribution, 79, 90–91, 157–158, 161, 179–180, 189, 223
 negative binomial process, 179–180
 new better than used, 82
 nonhomogeneous birth intensity, 74
 nonhomogeneous birth process, 74
 nonhomogeneous Poisson intensity, 73
 nonhomogeneous Poisson process, 73, 77–80, 83–85, 89–91
 nonhomogeneous renewal process, 83, 93
 nonlinear regression, 34
 normal distribution, 6, 10, 18–29, 194, 233, 255–259, 270–275, 294–295
 multivariate, 7, 8, 213–230, 234–240, 303–313
 normalising constant, 158
 numerical integration, 50, 255, 304
 observation equation, 162, 173, 255
 observation update, 163, 173, 257, 258
 occurrence function, 195
 operational time, 74, 78
 optimisation
 nonlinear, 203
 orderly process, 72, 76, 79, 83
 Ornstein–Uhlenbeck diffusion process, 238–240
 outlier, 240, 308
 overdispersion, 82

- counts, 64–66, 90–91, 157–161, 178–180, 188–190, 276
- durations, 167–178
- measurements, 262–264
- PACF, 215–216
- panel design, 115
- Pareto distribution, 169, 171, 196–198
- partial autocorrelation function, 215–216
- period, 226, 227
- period effect, 308–310
- periodicity, 106–107
- periodogram, 226–228
 - cumulative, 228
- persistent state, 107
- pharmacokinetics, 285–295
- phase, 227
- point event, 5
- point process, 72–76
 - binary, 71–93, 108–114
 - clustered, 165–167
 - doubly stochastic, 79, 198–202
 - marked, 73, 79, 195–198
- Poisson distribution, 6, 29, 61, 64, 75–76, 152–153, 157, 203, 223
- Poisson intensity, 73
 - nonhomogeneous, 73
- Poisson process, 73, 75–83, 105–106, 143, 189, 194
 - alternating, 134, 199
 - compound, 195–196
 - doubly stochastic, 199
 - mixed, 199
 - nonhomogeneous, 73, 77–80, 83–85, 89–91, 138, 203–205, 276
- Poisson regression, 89
- Poisson renewal process, 78
- population-averaged model, 304, 305
- power exponential distribution, 247
- prediction, 6, 12, 13, 151, 155, 162, 256, 270
 - one-step-ahead, 162, 173, 257, 258
 - recursive, 158–161, 180, 219–220, 252, 259–262, 264, 271–275, 279, 307, 313
- probability
 - forward recurrence, 164
 - recurrence, 107
- probability transition matrix, 102–124, 136
- process
 - autoregression, 12–13, 191–194, 216–224, 228–229, 256–257
 - continuous, 218, 257–259
 - birth, 13–14, 71, 79, 93, 175, 177–178, 183–190, 194, 202
 - doubly stochastic, 202
 - linear, 78, 143
 - nonhomogeneous, 74
 - pure, 74, 143
 - birth and death, 108
 - Brownian motion, 194, 233, 234, 238, 239
 - compound Poisson, 195–196
 - contagion, 78, 183–190
 - counting, 72–76
 - deterministic, 6
 - diffusion, 12, 233–252, 289–293
 - integrated Ornstein–Uhlenbeck, 219, 239
 - Ornstein–Uhlenbeck, 238–240
 - Wiener, 194, 224, 233–240
 - gamma, 194
 - learning, 186–188
 - mark–accumulator, 195, 196
 - Markov, 11–12
 - Markov chain, 11, 101–124, 151, 167, 196–198
 - aperiodic, 106–107
 - continuous-state, 191
 - continuous-time, 134–142, 286
 - embedded, 137, 139, 141, 143
 - first-order, 115–117
 - hidden, 151, 161–167, 205–206, 259–263
 - irreducible, 104–107, 135, 139, 162
 - periodic, 106–107
 - second-order, 118–119
 - Markov renewal, 74, 137–138, 144–145
 - memoryless, 77
 - negative binomial, 179–180
 - orderly, 72, 76, 79, 83
 - point, 72–76
 - binary, 108–114
 - doubly stochastic, 79, 198–202
 - marked, 73, 79, 195–198
 - Poisson, 73, 75–83, 105–106, 143, 189, 194
 - alternating, 134, 199
 - compound, 195–196
 - doubly stochastic, 199
 - mixed, 199
 - nonhomogeneous, 73, 77–80, 83–85, 89–91, 138, 203–205, 276
 - pure jump, 136
 - random walk, 107–108, 121–122, 223–224, 234, 289–293
 - renewal, 9, 71, 72, 74, 79–83, 85–87, 89, 91–93, 138
 - Burr, 176–177
 - doubly stochastic, 199–202
 - log normal, 176–177
 - Markov, 74, 137–138, 144–145
 - nonhomogeneous, 83, 93
 - Poisson, 78
 - Weibull, 76, 176–177, 201
 - self-exciting, 198
 - semi-Markov, 74, 134, 137–138, 144–145, 198
 - stochastic, 3–16
 - stationary, 8
 - survival, 39–66
 - Wiener diffusion, 194, 224, 233–240
 - Yule, 74
- process time, 43
- product limit estimate, 47
- profile, 155
 - marginal, 102, 151, 259
 - underlying, 7, 151, 152, 155, 157–158, 219–220, 252, 259–262, 264, 273–275, 279, 307, 313
- progressive model, 133, 134, 142–145
- proportional hazards, 48–49
 - semiparametric, 48, 76
- prospective design, 43–45
- pure birth process, 143
- pure jump process, 136
- quasi-independence model, 122–124
- quasi-symmetry model, 119
- random coefficients, 310–313
- random effects, 171–172, 239, 303–306
- random walk, 107–108, 121–122, 223–224, 234, 289–293
- randomness, 6
 - departures, 79–80
- rate
 - absorption, 287, 288

- elimination, 287, 288
 - exponential, 291
 - failure, 45
 - mortality, 45
- rate function, 72
- reached state, 104
- reciprocal link function, 30–31
- recurrence, 106–107
- recurrence probability, 107
- recurrence time, 106
 - backward, 81
 - forward, 81
- recurrent events, 5, 9, 13, 71–93, 133, 134
- recurrent state, 106–107
- recursive prediction, 158–161, 180, 219–220, 252, 259–262, 264, 271–275, 279, 307, 313
- recursive residuals, 13, 220
- reflecting barrier, 108, 121, 289
- regeneration point, 9, 77, 80, 106
- regression
 - linear, 21–25
 - multiple, 24–25
 - log linear, 75
 - logistic, 101, 108, 109, 111–114, 184–185, 196
 - nonlinear, 34
 - Poisson, 89
- renewal function, 72, 80
- renewal intensity, 74, 80–81
- renewal process, 9, 71, 72, 74, 79–83, 85–87, 89, 91–93, 138
 - Burr, 176–177
 - doubly stochastic, 199–202
 - log normal, 176–177
 - Markov, 74, 137–138, 144–145
 - nonhomogeneous, 83, 93
 - Poisson, 78
 - Weibull, 76, 176–177, 201
- repeated events, *see* recurrent events
- repeated measurements, 303–313
- replications, 9–10
- reset test, 213
- residual lifetime, 81
- residuals, 13, 73, 256
 - previous, 217, 220, 249, 272
 - recursive, 13, 220
 - squared, 251
- retrospective design, 18, 43
- return time, 106
- reversibility, 103, 119–121
- Richards growth curve, 278–279
- risk function, 45
- risk set, 47, 58

- S-shaped growth curve, 275–278
- saturated model, 47, 65, 114, 117, 119, 121–123, 309
- scatterplot, 19–21
- score equation, 235
- seasonality, 213–215, 217, 219–221
- self-exciting process, 198
- semi-Markov process, 74, 134, 137–138, 144–145, 198
- semiparametric proportional hazards, 48, 76
- sequence effect, 308, 309
- serial dependence, 12–13, 152–158, 160
- serial update, 175
- series-specific model, 304
- sigmoidal growth curve, 275–278
- simplex distribution, 293–295
- sink compartment, 285

- skew Laplace distribution, 247–249
- slope, 22
 - random, 305
- smoother
 - Kalman, 217, 255–259
- smoothing, 227
- source compartment, 285
- spectral analysis, 226–230
- spectral decomposition, 104, 136
- spectral density function, 226, 227
- spells, 161–167, 259
- spherical autocorrelation, 219
- stable distribution, 241–246
- staggered entry, 43
- state, 3
 - absorbing, 40–41, 60, 64, 105, 107, 133, 134, 136–138, 142, 205
 - accessible, 104
 - communicating, 104
 - ergodic, 107
 - hidden, 5, 161–180, 205–206, 259–262
 - persistent, 107
 - reached, 104
 - recurrent, 106–107
 - transient, 106–107, 138
- state dependence, 12, 45, 61, 75, 166
- state equation, 256
- state space, 3, 5–6, 11, 102
 - minimal, 5
- state transition equation, 162, 173, 256, 257
- state transition matrix, 256
- stationarity, 8, 74, 80–81, 103, 105, 107, 115, 137, 258, 269
 - second-order, 8
 - strict, 8
- stationary increments, 73, 76, 194, 196, 269
- steady-state equation, 103
- stochastic integral, 75
- stochastic process, 3–16
 - stationary, 8
- stochastic transition matrix, 102, 174, 256, 260
- stopping rule, 42–43
- stopping time, 43, 44, 73, 106
- Student *t* distribution, 233, 247
- survival process, 39–66
- survivor function, 45–47, 50, 72–76, 144
 - exponential, 50, 77
 - log logistic, 50
 - Weibull, 50
- symmetry model, 119

- Taylor's series, 25, 244
- test
 - Chow, 213
 - Durbin–Watson, 213
 - reset, 213
- theorem
 - central limit, 241
 - elementary renewal, 80, 107
 - ergodic, 8
- thinning, 77, 80
- time, 4
 - aligned, 43
 - arrival, 71, 73, 74, 78
 - chronological, 43
 - continuous, 4, 12, 164, 218
 - discrete, 4, 12, 101–124
 - first passage, 106
 - hitting, 106

- interarrival, 71, 73, 74, 76, 78–83, 87, 93, 108, 199, 203
- operational, 78
- process, 43
- recurrence, 106
- return, 106
- stopping, 43, 44, 73, 106
- time alignment, 43–45
- time censoring, 42
- time domain, 226
- time origin, 8, 14, 41, 43, 48, 71–72, 80, 177, 179, 183, 202, 311
- time reversible, 103, 119–121
- time series, 203, 213–230, 233–252, 255–264, 269
- time update, 162, 173, 257, 258
- time-varying covariate, 10, 12
 - endogenous, 5, 46, 74
 - exogenous, 5, 79
- training, 162
- transfer matrix, 286
- transformation
 - log, 220–221
 - time, 236–238
- transient state, 106–107, 138
- transition, 133–134
- transition intensity, 72, 134, 164, 189, 261
- transition matrix
 - hidden, 161–167, 206, 259–262
 - homogeneous, 102–108, 115–117, 141–142
 - intensity, 136–145, 164, 189, 261
 - probability, 102–124, 136
 - stochastic, 102, 174, 256, 260
- transition probability
 - Markovian, 134
- trend, 7, 10, 83–85
- underdispersion, 90–91, 188–190
- underlying profile, 7, 151, 152, 155, 157–158, 219–220, 252, 259–262, 264, 273–275, 279, 307, 313
- update
 - count, 174, 177–178, 180
 - cumulated, 174
 - event, 175
 - filtering, 163, 173, 257, 258
 - frailty, 171–172, 179, 312
 - Kalman, 174
 - Markov, 175, 177, 178, 262
 - observation, 163, 173, 257, 258
 - parameter, 171–175
 - serial, 175
 - time, 162, 173, 257, 258
- variable
 - dummy, *see* indicator
 - explanatory, *see* covariate
 - factor, 26
 - independent, *see* covariate
 - indicator, 26–27
 - Viterbi algorithm, 164
 - volatility, 171, 233–252, 262
- volume of distribution
 - apparent, 289
- von Bertalanffy growth curve, 273
- wearing out, 82
- Weibull distribution, 32, 47–60, 74, 91–93, 170–171, 196–202, 260–262
- Weibull intensity, 50, 61–64, 144–145
- Weibull renewal process, 76, 176–177, 201
- Weibull survivor function, 50
- weighted average, 227
- white noise, 228
- Wiener diffusion process, 194, 224, 233–240
- window, 8, 85
- Yule process, 74