speedtest

Benjamin Christoffersen

2017-09-19

Setup

```r
library(dynamichazard); library(microbenchmark)
```

```
## Loading required package: survival
```

```r
sim_func <- function(n, p){
  func <- asNamespace("dynamichazard")$test_sim_func_logit
  set.seed(101)
  t_max <- 30L
  func(n_series = n, n_vars = p, t_max = t_max, x_range = 1, x_mean = 0,
       beta_start = runif(p, -1.5, 1.5),
       intercept_start = -3, sds = c(.1, rep(.25, p)),
       tstart_sampl_func = function(t0, t_max)
         max(0, runif(1, -t_max, t_max - 1L)),
       lambda = 1 / 10)
}

get_rune_time_summary <- function(n, p){
  sims <- sim_func(n, p)

  out <- summary(microbenchmark(
    EKF_one_correction_step =
      suppressMessages(ddhazard(
        formula = Surv(tstart, tstop, event) ~ . - id,
        data = sims$res,
        model = "logit",
        id = sims$res$id,
        by = 1L,
        max_T = 30L,
        Q_0 = diag(1e6, p + 1L),
        Q = diag(1e-1, p + 1L))),

    EKF_more_correction_step =
      suppressMessages(ddhazard(
        formula = Surv(tstart, tstop, event) ~ . - id,
        data = sims$res,
        model = "logit",
        id = sims$res$id,
        by = 1L,
        max_T = 30L,
        Q_0 = diag(1, p + 1L),
        Q = diag(1e-1, p + 1L),
        control = list(NR_eps = 1e-3))),

    SMA = suppressMessages(ddhazard(
        formula = Surv(tstart, tstop, event) ~ . - id,
        data = sims$res,
        model = "logit",
        id = sims$res$id,
        by = 1L,
        max_T = 30L,
        Q_0 = diag(1e6, p + 1L),
        Q = diag(1e-1, p + 1L),
        control = list(method = "SMA"))),

    GMA = suppressMessages(ddhazard(
        formula = Surv(tstart, tstop, event) ~ . - id,
        data = sims$res,
        model = "logit",
        id = sims$res$id,
        by = 1L,
        max_T = 30L,
        Q_0 = diag(1, p + 1L),
        Q = diag(1e-1, p + 1L),
        control = list(method = "GMA"))),

    UKF = suppressMessages(ddhazard(
        formula = Surv(tstart, tstop, event) ~ . - id,
        data = sims$res,
        model = "logit",
        id = sims$res$id,
        by = 1L,
        max_T = 30L,
        Q_0 = diag(1, p + 1L),
        Q = diag(1e-1, p + 1L),
        control = list(method = "UKF"))),

    times = 5
  ))

  cat("(n, p) = (", n, ", ", p, ")",
      ". Units is ", sQuote(attr(out, "unit")), "\n", sep = "")

  print(out[, c("expr", "lq", "median", "uq")], row.names = FALSE)

  cat("\n\n")

  invisible()
}
```

Test

```
grid_vals <- expand.grid(
  n = c(250, 1000, 10000),
  p = c(5, 10, 15))
```

```r
invisible(
  mapply(get_rune_time_summary, n = grid_vals$n, p = grid_vals$p))
```

```
## (n, p) = (250, 5). Units is 'milliseconds'
##                         expr  lq median    uq
##   EKF_one_correction_step  73   74.7  78.7
##  EKF_more_correction_step 143  144.6 144.8
##                          SMA 176  177.1 178.2
##                          GMA 178  184.7 186.4
##                          UKF 189  194.8 196.9
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                         expr  lq median  uq
##   EKF_one_correction_step 208    209 215
##  EKF_more_correction_step 582    589 606
##                          SMA 483    483 496
##                          GMA 325    331 332
##                          UKF 401    409 412
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                         expr   lq median   uq
##   EKF_one_correction_step  421    508  524
##  EKF_more_correction_step  973   1017 1040
##                          SMA 2005   2082 2185
##                          GMA  681    729  750
##                          UKF 2113   2116 2268
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                         expr  lq median  uq
##   EKF_one_correction_step 113    132 135
##  EKF_more_correction_step 270    277 279
##                          SMA 390    400 405
##                          GMA 347    375 375
##                          UKF 524    539 542
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                         expr  lq median  uq
##   EKF_one_correction_step 160    163 179
##  EKF_more_correction_step 335    342 346
##                          SMA 490    491 507
##                          GMA 244    247 247
##                          UKF 577    585 595
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                         expr   lq median   uq
##   EKF_one_correction_step  499    504  505
##  EKF_more_correction_step 1064   1104 1106
##                          SMA 2869   2908 2909
##                          GMA  842    870  884
##                      UKF 3235   3306 3355
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                     expr   lq median   uq
##   EKF_one_correction_step  299    304  305
##  EKF_more_correction_step  340    341  344
##                      SMA  854    921  921
##                      GMA  425    426  427
##                      UKF 1120   1122 1128
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                     expr   lq median   uq
##   EKF_one_correction_step  240    241  243
##  EKF_more_correction_step  492    497  500
##                      SMA  943   1031 1069
##                      GMA  389    392  397
##                      UKF 1042   1044 1045
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                     expr   lq median   uq
##   EKF_one_correction_step  454    467  558
##  EKF_more_correction_step 1076   1077 1084
##                      SMA 3934   3937 3940
##                      GMA  834    843  912
##                      UKF 4104   4193 4205
```

Session info

- R version 3.4.1 (2017-06-30), `x86_64-w64-mingw32`
- Locale: `LC_COLLATE=English_United States.1252`, `LC_CTYPE=C`, `LC_MONETARY=English_United States.1252`, `LC_NUMERIC=C`, `LC_TIME=English_United States.1252`
- Running under: `Windows 10 x64 (build 15063)`
- Matrix products: default
- Base packages: base, datasets, graphics, grDevices, methods, stats, utils
- Other packages: dynamichazard 0.4.0, microbenchmark 1.4-2.1, survival 2.41-3
- Loaded via a namespace (and not attached): backports 1.1.0, boot 1.3-19, colorspace 1.3-2, compiler 3.4.1, data.table 1.10.4, digest 0.6.12, evaluate 0.10.1, ggplot2 2.2.1, grid 3.4.1, gtable 0.2.0, htmltools 0.3.6, knitr 1.17, lattice 0.20-35, lazyeval 0.2.0, magrittr 1.5, Matrix 1.2-10, munsell 0.4.3, plyr 1.8.4, Rcpp 0.12.12, rlang 0.1.2, rmarkdown 1.6, rprojroot 1.2, scales 0.5.0, splines 3.4.1, stringi 1.1.5, stringr 1.2.0, tibble 1.3.4, tools 3.4.1, yaml 2.1.14