speedtest

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2017-11-25

Setup

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

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

```
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  77.2   77.8  81.3
##  EKF_more_correction_step 118.5  123.7 130.3
##                          SMA 187.7  191.2 214.1
##                          GMA 156.8  160.9 170.1
##                          UKF 287.0  292.9 292.9
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                         expr  lq median  uq
##   EKF_one_correction_step 214    215 220
##  EKF_more_correction_step 538    575 582
##                          SMA 540    548 551
##                          GMA 276    277 286
##                          UKF 544    545 558
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                         expr   lq median   uq
##   EKF_one_correction_step  447    531  537
##  EKF_more_correction_step 1076   1089 1091
##                          SMA 2267   2278 2332
##                          GMA  908   1008 1031
##                          UKF 2485   2518 2644
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                         expr  lq median  uq
##   EKF_one_correction_step 122    122 125
##  EKF_more_correction_step 277    278 278
##                          SMA 442    449 452
##                          GMA 327    346 348
##                          UKF 923    930 977
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                         expr  lq median  uq
##   EKF_one_correction_step 146    149 151
##  EKF_more_correction_step 331    332 332
##                          SMA 548    553 555
##                          GMA 232    233 244
##                          UKF 840    847 878
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                         expr   lq median   uq
##   EKF_one_correction_step  508    512  536
##  EKF_more_correction_step 1041   1045 1192
##                          SMA 3128   3320 3399
##                          GMA 1235   1260 1274
##                       UKF 4087   4117 4179
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  340    351  353
##  EKF_more_correction_step  336    353  400
##                       SMA  969   1031 1071
##                       GMA  427    457  463
##                       UKF 2311   2315 2339
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  231    240  241
##  EKF_more_correction_step  465    467  482
##                       SMA 1019   1107 1148
##                       GMA  360    368  369
##                       UKF 1605   1619 1649
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  527    587  591
##  EKF_more_correction_step 1156   1228 1247
##                       SMA 4272   4273 4308
##                       GMA 1269   1300 1338
##                       UKF 5677   5797 5814
```

Session info

- R version 3.4.2 (2017-09-28), `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 0.5.1, microbenchmark 1.4-2.1, survival 2.41-3
- Loaded via a namespace (and not attached): backports 1.1.0, boot 1.3-20, codetools 0.2-15, colorspace 1.3-2, compiler 3.4.2, data.table 1.10.4-2, digest 0.6.12, evaluate 0.10.1, ggplot2 2.2.1, grid 3.4.2, gtable 0.2.0, htmltools 0.3.6, knitr 1.17, lattice 0.20-35, lazyeval 0.2.0, magrittr 1.5, MASS 7.3-47, Matrix 1.2-11, multcomp 1.4-7, munsell 0.4.3, mvtnorm 1.0-6, parallel 3.4.2, plyr 1.8.4, Rcpp 0.12.13, rlang 0.1.4, rmarkdown 1.6, rprojroot 1.2, sandwich 2.4-0, scales 0.5.0, splines 3.4.2, stringi 1.1.5, stringr 1.2.0, TH.data 1.0-8, tibble 1.3.4, tools 3.4.2, yaml 2.1.14, zoo 1.8-0