speedtest

Benjamin Christoffersen

2019-02-15

Setup

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

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

```r
sim_func <- function(n, p){
  func <- 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 = 1
  ))

  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))
```

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

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

(n, p) = (250, 5). Units is 'milliseconds'
expr   lq median   uq
EKF_one_correction_step 30.6   30.6 30.6
EKF_more_correction_step 61.9   61.9 61.9
SMA 112.2 112.2 112.2
GMA 57.8   57.8 57.8
UKF 172.8 172.8 172.8

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

(n, p) = (1000, 5). Units is 'milliseconds'
expr   lq median   uq
EKF_one_correction_step 71.8   71.8 71.8
EKF_more_correction_step 183.7 183.7 183.7
SMA 365.2 365.2 365.2
GMA 119.5 119.5 119.5
UKF 231.3 231.3 231.3

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

(n, p) = (10000, 5). Units is 'milliseconds'
expr   lq median   uq
EKF_one_correction_step   98.4   98.4   98.4
EKF_more_correction_step 173.2 173.2 173.2
SMA 1491.1 1491.1 1491.1
```

```
##                             GMA  458.4  458.4   458.4
##                             UKF 1049.4 1049.4 1049.4

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## (n, p) = (250, 10). Units is 'milliseconds'
##                      expr    lq median    uq
##   EKF_one_correction_step  71.5   71.5  71.5
##  EKF_more_correction_step 139.2  139.2 139.2
##                       SMA 302.3  302.3 302.3
##                       GMA 145.6  145.6 145.6
##                       UKF 563.1  563.1 563.1

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## (n, p) = (1000, 10). Units is 'milliseconds'
##                      expr    lq median    uq
##   EKF_one_correction_step  61.5   61.5  61.5
##  EKF_more_correction_step 122.8  122.8 122.8
##                       SMA 357.4  357.4 357.4
##                       GMA 110.9  110.9 110.9
##                       UKF 433.4  433.4 433.4

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## (n, p) = (10000, 10). Units is 'milliseconds'
##                      expr  lq median    uq
##   EKF_one_correction_step 147    147   147
##  EKF_more_correction_step 297    297   297
##                       SMA 1967   1967 1967
##                       GMA 633    633   633
```

```
##                              UKF 1860    1860 1860

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## (n, p) = (250, 15). Units is 'milliseconds'
##                        expr  lq median   uq
##   EKF_one_correction_step  189     189  189
##  EKF_more_correction_step  208     208  208
##                       SMA  616     616  616
##                       GMA  206     206  206
##                       UKF 1383    1383 1383

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## (n, p) = (1000, 15). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step  111     111 111
##  EKF_more_correction_step  212     212 212
##                       SMA  619     619 619
##                       GMA  199     199 199
##                       UKF  876     876 876

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data =
## sims$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## (n, p) = (10000, 15). Units is 'milliseconds'
##                        expr   lq median   uq
##   EKF_one_correction_step  167     167  167
##  EKF_more_correction_step  346     346  346
##                       SMA 2766    2766 2766
##                       GMA  711     711  711
##                       UKF 2257    2257 2257
```

Session info

- R version 3.5.2 (2018-12-20), `x86_64-pc-linux-gnu`

- Locale: `LC_CTYPE=en_US.UTF-8`, `LC_NUMERIC=C`, `LC_TIME=en_US.UTF-8`, `LC_COLLATE=en_US.UTF-8`, `LC_MONETARY=en_US.UTF-8`, `LC_MESSAGES=en_US.UTF-8`, `LC_PAPER=en_US.UTF-8`, `LC_NAME=C`, `LC_ADDRESS=C`, `LC_TELEPHONE=C`, `LC_MEASUREMENT=en_US.UTF-8`, `LC_IDENTIFICATION=C`

- Running under: `Ubuntu 18.04.1 LTS`

- Matrix products: default

- BLAS: `/usr/lib/x86_64-linux-gnu/blas/libblas.so.3.7.1`

- LAPACK: `/usr/lib/x86_64-linux-gnu/lapack/liblapack.so.3.7.1`

- Base packages: base, datasets, graphics, grDevices, methods, stats, utils

- Other packages: dynamichazard 0.6.3, microbenchmark 1.4-6, survival 2.43-3

- Loaded via a namespace (and not attached): boot 1.3-20, compiler 3.5.2, digest 0.6.18, evaluate 0.12, grid 3.5.2, htmltools 0.3.6, knitr 1.21, lattice 0.20-38, magrittr 1.5, Matrix 1.2-15, nloptr 1.2.1, parallel 3.5.2, Rcpp 1.0.0, rmarkdown 1.11, splines 3.5.2, stringi 1.2.4, stringr 1.3.1, tools 3.5.2, xfun 0.4, yaml 2.2.0