speedtest

Benjamin Christoffersen

2017-10-24

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  61.4   62.2  64.2
##  EKF_more_correction_step 118.6  124.2 129.1
##                       SMA 172.5  183.6 187.6
##                       GMA 159.8  161.0 167.9
##                       UKF 214.9  219.2 219.3
## 
## 
## (n, p) = (1000, 5). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 209    210 213
##  EKF_more_correction_step 543    549 558
##                       SMA 521    534 539
##                       GMA 279    281 281
##                       UKF 458    470 478
## 
## 
## (n, p) = (10000, 5). Units is 'milliseconds'
##                        expr   lq median   uq
##   EKF_one_correction_step  427    503  505
##  EKF_more_correction_step  931    939  950
##                       SMA 2163   2192 2199
##                       GMA  653    671  673
##                       UKF 2298   2347 2379
## 
## 
## (n, p) = (250, 10). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 122    124 125
##  EKF_more_correction_step 245    245 250
##                       SMA 424    427 438
##                       GMA 335    339 342
##                       UKF 573    585 590
## 
## 
## (n, p) = (1000, 10). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 133    146 153
##  EKF_more_correction_step 319    322 323
##                       SMA 509    521 523
##                       GMA 218    220 220
##                       UKF 648    654 661
## 
## 
## (n, p) = (10000, 10). Units is 'milliseconds'
##                        expr   lq median   uq
##   EKF_one_correction_step  582    587  599
##  EKF_more_correction_step  986   1028 1079
##                       SMA 3085   3154 3279
##                       GMA  831    833  924
##                        UKF 3600   3633 3646
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  284    292  295
##  EKF_more_correction_step  323    329  329
##                        SMA  920    938  941
##                        GMA  394    396  396
##                        UKF 1166   1177 1191
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  224    232  233
##  EKF_more_correction_step  432    446  473
##                        SMA 1054   1068 1246
##                        GMA  355    359  384
##                        UKF 1153   1162 1196
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  455    459  467
##  EKF_more_correction_step 1007   1007 1069
##                        SMA 4060   4201 4317
##                        GMA  749    834  856
##                        UKF 4509   4561 4611
```

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 1.10.4-2, 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, parallel 3.4.1, plyr 1.8.4, Rcpp 0.12.13, 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