speedtest

Benjamin Christoffersen

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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 = 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))
```

```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  57.3   57.3  57.3
##  EKF_more_correction_step 112.8  112.8 112.8
##                       SMA 198.5  198.5 198.5
##                       GMA 225.7  225.7 225.7
##                       UKF 295.7  295.7 295.7
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                       expr  lq median  uq
##    EKF_one_correction_step 205    205 205
##  EKF_more_correction_step 565    565 565
##                       SMA 605    605 605
##                       GMA 270    270 270
##                       UKF 501    501 501
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                       expr   lq median   uq
##    EKF_one_correction_step  439    439  439
##  EKF_more_correction_step  889    889  889
##                       SMA 2632   2632 2632
##                       GMA  841    841  841
##                       UKF 2510   2510 2510
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                       expr  lq median  uq
##    EKF_one_correction_step 108    108 108
##  EKF_more_correction_step 240    240 240
##                       SMA 489    489 489
##                       GMA 361    361 361
##                       UKF 991    991 991
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                       expr  lq median  uq
##    EKF_one_correction_step 138    138 138
##  EKF_more_correction_step 302    302 302
##                       SMA 558    558 558
##                       GMA 203    203 203
##                       UKF 863    863 863
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                       expr   lq median   uq
##    EKF_one_correction_step  511    511  511
##  EKF_more_correction_step  995    995  995
##                       SMA 3120   3120 3120
##                       GMA 1037   1037 1037
```

```
##                          UKF 3947    3947 3947
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                        expr   lq median   uq
##    EKF_one_correction_step  293    293  293
##  EKF_more_correction_step  303    303  303
##                         SMA 1052   1052 1052
##                         GMA  420    420  420
##                         UKF 2014   2014 2014
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                        expr   lq median   uq
##    EKF_one_correction_step  199    199  199
##  EKF_more_correction_step  421    421  421
##                         SMA  954    954  954
##                         GMA  326    326  326
##                         UKF 1442   1442 1442
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                        expr   lq median   uq
##    EKF_one_correction_step  424    424  424
##  EKF_more_correction_step  886    886  886
##                         SMA 4104   4104 4104
##                         GMA 1122   1122 1122
##                         UKF 5245   5245 5245
```

Session info

- R version 3.5.0 (2018-04-23), `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 17134)`

- Matrix products: default

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

- Other packages: dynamichazard 0.5.3, microbenchmark 1.4-4, survival 2.41-3

- Loaded via a namespace (and not attached): backports 1.1.2, boot 1.3-20, compiler 3.5.0, digest 0.6.15, evaluate 0.10.1, grid 3.5.0, htmltools 0.3.6, knitr 1.20, lattice 0.20-35, magrittr 1.5, Matrix 1.2-14, parallel 3.5.0, Rcpp 0.12.17, rmarkdown 1.9, rprojroot 1.3-2, splines 3.5.0, stringi 1.1.7, stringr 1.3.0, tools 3.5.0, yaml 2.1.18