speedtest

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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 = 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))
```

```
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  53.6     63  75.5
##  EKF_more_correction_step 104.6    111 124.2
##                       SMA 168.5    173 173.8
##                       GMA 150.9    153 160.8
##                       UKF 272.4    278 280.4
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                     expr  lq median  uq
##    EKF_one_correction_step 177    180 189
##  EKF_more_correction_step 486    493 498
##                       SMA 521    522 531
##                       GMA 252    260 264
##                       UKF 481    482 484
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                     expr   lq median   uq
##    EKF_one_correction_step  388    398  486
##  EKF_more_correction_step  877    892  961
##                       SMA 1950   2031 2034
##                       GMA  891    893  902
##                       UKF 2278   2331 2358
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                     expr  lq median  uq
##    EKF_one_correction_step 107    117 123
##  EKF_more_correction_step 228    230 240
##                       SMA 392    396 421
##                       GMA 288    303 305
##                       UKF 825    829 840
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                     expr  lq median  uq
##    EKF_one_correction_step 142    146 147
##  EKF_more_correction_step 291    293 294
##                       SMA 480    499 506
##                       GMA 203    205 208
##                       UKF 784    785 796
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                     expr   lq median   uq
##    EKF_one_correction_step  545    563  569
##  EKF_more_correction_step  950    962 1031
##                       SMA 2780   2825 2865
##                       GMA 1033   1064 1091
```

```
##                        UKF 3581    3641 3708
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##    EKF_one_correction_step  294    300  303
##  EKF_more_correction_step  304    306  308
##                        SMA  835    906  907
##                        GMA  366    377  378
##                        UKF 1987   1991 2001
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##    EKF_one_correction_step  227    229  230
##  EKF_more_correction_step  443    450  453
##                        SMA  912    999 1087
##                        GMA  325    326  332
##                        UKF 1447   1488 1537
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##    EKF_one_correction_step  423    521  538
##  EKF_more_correction_step  960   1024 1048
##                        SMA 3799   3846 3865
##                        GMA 1183   1195 1202
##                        UKF 4810   4818 4840
```

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 16299)`

- 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