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 = 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  94.1   94.1  94.1
##  EKF_more_correction_step 152.6  152.6 152.6
##                       SMA 196.5  196.5 196.5
##                       GMA 285.6  285.6 285.6
##                       UKF 400.1  400.1 400.1
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                      expr  lq median  uq
##   EKF_one_correction_step 208    208 208
##  EKF_more_correction_step 545    545 545
##                       SMA 596    596 596
##                       GMA 297    297 297
##                       UKF 516    516 516
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  355    355  355
##  EKF_more_correction_step  939    939  939
##                       SMA 2290   2290 2290
##                       GMA  994    994  994
##                       UKF 2584   2584 2584
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                      expr  lq median  uq
##   EKF_one_correction_step 102    102 102
##  EKF_more_correction_step 255    255 255
##                       SMA 445    445 445
##                       GMA 338    338 338
##                       UKF 817    817 817
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                      expr  lq median  uq
##   EKF_one_correction_step 134    134 134
##  EKF_more_correction_step 299    299 299
##                       SMA 988    988 988
##                       GMA 206    206 206
##                       UKF 772    772 772
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  521    521  521
##  EKF_more_correction_step  937    937  937
##                       SMA 3005   3005 3005
##                       GMA  951    951  951
```

```
##                             UKF 3880    3880 3880
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  302    302  302
##  EKF_more_correction_step  308    308  308
##                        SMA  886    886  886
##                        GMA  415    415  415
##                        UKF 1936   1936 1936
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  235    235  235
##  EKF_more_correction_step  483    483  483
##                        SMA 1257   1257 1257
##                        GMA  337    337  337
##                        UKF 1501   1501 1501
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  417    417  417
##  EKF_more_correction_step 1020   1020 1020
##                        SMA 4022   4022 4022
##                        GMA 1110   1110 1110
##                        UKF 5003   5003 5003
```

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 0.6.0, 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