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  58.4   58.4  58.4
##  EKF_more_correction_step 117.5  117.5 117.5
##                       SMA 204.1  204.1 204.1
##                       GMA 177.6  177.6 177.6
##                       UKF 292.0  292.0 292.0
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                      expr  lq median  uq
##    EKF_one_correction_step 180    180 180
##  EKF_more_correction_step 573    573 573
##                       SMA 632    632 632
##                       GMA 281    281 281
##                       UKF 486    486 486
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                      expr   lq median   uq
##    EKF_one_correction_step  418    418  418
##  EKF_more_correction_step  903    903  903
##                       SMA 2296   2296 2296
##                       GMA  827    827  827
##                       UKF 2344   2344 2344
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                      expr  lq median  uq
##    EKF_one_correction_step 116    116 116
##  EKF_more_correction_step 238    238 238
##                       SMA 438    438 438
##                       GMA 346    346 346
##                       UKF 841    841 841
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                      expr  lq median  uq
##    EKF_one_correction_step 137    137 137
##  EKF_more_correction_step 298    298 298
##                       SMA 502    502 502
##                       GMA 199    199 199
##                       UKF 749    749 749
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                      expr   lq median   uq
##    EKF_one_correction_step  455    455  455
##  EKF_more_correction_step  934    934  934
##                       SMA 3169   3169 3169
##                       GMA  985    985  985
```

```
##                             UKF 4002     4002 4002
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  307    307  307
##  EKF_more_correction_step  313    313  313
##                       SMA 1250   1250 1250
##                       GMA  475    475  475
##                       UKF 1998   1998 1998
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  192    192  192
##  EKF_more_correction_step  449    449  449
##                       SMA  937    937  937
##                       GMA  354    354  354
##                       UKF 1507   1507 1507
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  416    416  416
##  EKF_more_correction_step  902    902  902
##                       SMA 5477   5477 5477
##                       GMA 1109   1109 1109
##                       UKF 5118   5118 5118
```

Session info