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))
```

```
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  60.8   60.8  60.8
##  EKF_more_correction_step 125.0  125.0 125.0
##                       SMA 190.5  190.5 190.5
##                       GMA 196.8  196.8 196.8
##                       UKF 338.4  338.4 338.4
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                       expr  lq median  uq
##    EKF_one_correction_step 198    198 198
##  EKF_more_correction_step 625    625 625
##                       SMA 639    639 639
##                       GMA 278    278 278
##                       UKF 513    513 513
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                       expr   lq median   uq
##    EKF_one_correction_step  380    380  380
##  EKF_more_correction_step  928    928  928
##                       SMA 4406   4406 4406
##                       GMA  837    837  837
##                       UKF 2519   2519 2519
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                       expr  lq median  uq
##    EKF_one_correction_step 107    107 107
##  EKF_more_correction_step 233    233 233
##                       SMA 444    444 444
##                       GMA 344    344 344
##                       UKF 840    840 840
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                       expr  lq median  uq
##    EKF_one_correction_step 144    144 144
##  EKF_more_correction_step 305    305 305
##                       SMA 519    519 519
##                       GMA 198    198 198
##                       UKF 757    757 757
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                       expr   lq median   uq
##    EKF_one_correction_step  561    561  561
##  EKF_more_correction_step  943    943  943
##                       SMA 3236   3236 3236
##                       GMA  978    978  978
```

```
##                         UKF 4204    4204 4204
## 
## 
## (n, p) = (250, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  279    279  279
##  EKF_more_correction_step  338    338  338
##                       SMA 1207   1207 1207
##                       GMA  418    418  418
##                       UKF 1974   1974 1974
## 
## 
## (n, p) = (1000, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  198    198  198
##  EKF_more_correction_step  478    478  478
##                       SMA 1041   1041 1041
##                       GMA  345    345  345
##                       UKF 1490   1490 1490
## 
## 
## (n, p) = (10000, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  453    453  453
##  EKF_more_correction_step  923    923  923
##                       SMA 4259   4259 4259
##                       GMA 1093   1093 1093
##                       UKF 5102   5102 5102
```

Session info