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  65.3   65.3  65.3
##  EKF_more_correction_step 119.2  119.2 119.2
##                       SMA 205.3  205.3 205.3
##                       GMA 194.3  194.3 194.3
##                       UKF 312.0  312.0 312.0
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                     expr  lq median  uq
##   EKF_one_correction_step 218    218 218
##  EKF_more_correction_step 579    579 579
##                       SMA 611    611 611
##                       GMA 273    273 273
##                       UKF 538    538 538
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                     expr   lq median   uq
##   EKF_one_correction_step  412    412  412
##  EKF_more_correction_step  945    945  945
##                       SMA 2549   2549 2549
##                       GMA  861    861  861
##                       UKF 2685   2685 2685
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                     expr  lq median  uq
##   EKF_one_correction_step 104    104 104
##  EKF_more_correction_step 240    240 240
##                       SMA 443    443 443
##                       GMA 364    364 364
##                       UKF 858    858 858
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                     expr  lq median  uq
##   EKF_one_correction_step 139    139 139
##  EKF_more_correction_step 305    305 305
##                       SMA 527    527 527
##                       GMA 218    218 218
##                       UKF 789    789 789
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                     expr   lq median   uq
##   EKF_one_correction_step  547    547  547
##  EKF_more_correction_step  962    962  962
##                       SMA 3068   3068 3068
##                       GMA  968    968  968
```

```
##                           UKF 3855    3855 3855
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                         expr   lq median   uq
##   EKF_one_correction_step  288     288  288
##  EKF_more_correction_step  311     311  311
##                           SMA 1012    1012 1012
##                           GMA  410     410  410
##                           UKF 2173    2173 2173
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                         expr   lq median   uq
##   EKF_one_correction_step  220     220  220
##  EKF_more_correction_step  465     465  465
##                           SMA  908     908  908
##                           GMA  329     329  329
##                           UKF 1430    1430 1430
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                         expr   lq median   uq
##   EKF_one_correction_step  420     420  420
##  EKF_more_correction_step  898     898  898
##                           SMA 3943    3943 3943
##                           GMA 1126    1126 1126
##                           UKF 5065    5065 5065
```

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