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  65.1   65.1  65.1
##  EKF_more_correction_step 131.5  131.5 131.5
##                       SMA 198.8  198.8 198.8
##                       GMA 208.8  208.8 208.8
##                       UKF 331.7  331.7 331.7
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 206    206 206
##  EKF_more_correction_step 606    606 606
##                       SMA 620    620 620
##                       GMA 284    284 284
##                       UKF 509    509 509
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                        expr   lq median   uq
##   EKF_one_correction_step  386    386  386
##  EKF_more_correction_step  883    883  883
##                       SMA 2566   2566 2566
##                       GMA  874    874  874
##                       UKF 2651   2651 2651
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 107    107 107
##  EKF_more_correction_step 246    246 246
##                       SMA 498    498 498
##                       GMA 395    395 395
##                       UKF 933    933 933
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 142    142 142
##  EKF_more_correction_step 302    302 302
##                       SMA 513    513 513
##                       GMA 208    208 208
##                       UKF 756    756 756
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                        expr    lq median    uq
##   EKF_one_correction_step  523    523  523
##  EKF_more_correction_step  935    935  935
##                       SMA 3131   3131 3131
##                       GMA 1008   1008 1008
```

```
##                      UKF 3967    3967 3967
## 
## 
## (n, p) = (250, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  291    291  291
##  EKF_more_correction_step  321    321  321
##                        SMA  915    915  915
##                        GMA  417    417  417
##                        UKF 1970   1970 1970
## 
## 
## (n, p) = (1000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  219    219  219
##  EKF_more_correction_step  464    464  464
##                        SMA  929    929  929
##                        GMA  327    327  327
##                        UKF 1455   1455 1455
## 
## 
## (n, p) = (10000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  402    402  402
##  EKF_more_correction_step  888    888  888
##                        SMA 4022   4022 4022
##                        GMA 1146   1146 1146
##                        UKF 4877   4877 4877
```

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