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 = 5
  ))

  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  69.6   81.9  98.9
##  EKF_more_correction_step 137.5  155.2 159.0
##                        SMA 184.6  188.1 190.2
##                        GMA 191.1  222.6 224.0
##                        UKF 212.1  244.4 245.3
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                        expr  lq median  uq
##    EKF_one_correction_step 234    240 247
##  EKF_more_correction_step 620    639 644
##                        SMA 521    521 534
##                        GMA 341    360 366
##                        UKF 445    468 481
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                        expr   lq median   uq
##    EKF_one_correction_step  412    502  516
##  EKF_more_correction_step  943   1037 1061
##                        SMA 2035   2039 2122
##                        GMA  633    711  717
##                        UKF 2130   2176 2186
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                        expr  lq median  uq
##    EKF_one_correction_step 122    132 134
##  EKF_more_correction_step 295    299 300
##                        SMA 415    419 434
##                        GMA 351    363 368
##                        UKF 532    542 561
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                        expr  lq median  uq
##    EKF_one_correction_step 160    160 163
##  EKF_more_correction_step 360    360 362
##                        SMA 469    492 492
##                        GMA 240    248 258
##                        UKF 579    579 582
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                        expr   lq median   uq
##    EKF_one_correction_step  474    487  500
##  EKF_more_correction_step 1021   1100 1104
##                        SMA 2810   2832 2885
##                        GMA  829    838  859
```

```
##                             UKF 3099    3137 3177
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                        expr   lq median   uq
##    EKF_one_correction_step  295    300  300
##   EKF_more_correction_step  333    352  352
##                         SMA  840    913  929
##                         GMA  418    423  439
##                         UKF 1087   1101 1102
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                        expr   lq median   uq
##    EKF_one_correction_step  239    240  244
##   EKF_more_correction_step  512    517  517
##                         SMA  936    992 1056
##                         GMA  375    377  378
##                         UKF 1015   1016 1029
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                        expr   lq median   uq
##    EKF_one_correction_step  455    459  529
##   EKF_more_correction_step 1070   1079 1111
##                         SMA 3838   3884 3952
##                         GMA  794    813  902
##                         UKF 4159   4209 4211
```

Session info

- R version 3.4.1 (2017-06-30), `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 15063)`

- Matrix products: default

- Base packages: base, datasets, graphics, grDevices, methods, stats, utils

- Other packages: dynamichazard 0.4.0, microbenchmark 1.4-2.1, survival 2.41-3

- Loaded via a namespace (and not attached): backports 1.1.0, boot 1.3-19, colorspace 1.3-2, compiler 3.4.1, data.table 1.10.4, digest 0.6.12, evaluate 0.10.1, ggplot2 2.2.1, grid 3.4.1, gtable 0.2.0, htmltools 0.3.6, knitr 1.17, lattice 0.20-35, lazyeval 0.2.0, magrittr 1.5, Matrix 1.2-10, munsell 0.4.3, plyr 1.8.4, Rcpp 0.12.12, rlang 0.1.2, rmarkdown 1.6, rprojroot 1.2, scales 0.5.0, splines 3.4.1, stringi 1.1.5, stringr 1.2.0, tibble 1.3.4, tools 3.4.1, yaml 2.1.14