speedtest

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Setup

```
library(dynamichazard); library(microbenchmark)
```

```
## Loading required package: survival
```

```
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", "cld")], 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 cld
##   EKF_one_correction_step  21.3   26.1  26.3   a
##  EKF_more_correction_step  34.9   35.5  46.2   a
##                       SMA 101.5  112.9 119.9   a
##                       GMA  36.3   38.9  39.6   a
##                       UKF  83.5   90.4  91.1   a
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                       expr    lq median    uq  cld
##   EKF_one_correction_step  31.8   32.4  32.4 a
##  EKF_more_correction_step  45.3   46.2  46.8  b
##                       SMA  60.9   61.4  69.4   c
##                       GMA  46.8   47.7  51.5  b
##                       UKF 108.7  114.4 116.8    d
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                       expr  lq median  uq cld
##   EKF_one_correction_step 264    268 270 a
##  EKF_more_correction_step 421    438 447  b
##                       SMA 528    610 630   c
##                       GMA 201    203 211 a
##                       UKF 595    608 725   c
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                       expr    lq median    uq  cld
##   EKF_one_correction_step  43.6   51.6  52.5 a
##  EKF_more_correction_step  82.2   84.9  92.1  b
##                       SMA 132.0  152.5 157.4   c
##                       GMA  73.4   78.6  80.3  b
##                       UKF 359.5  360.3 364.5    d
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                       expr    lq median    uq  cld
##   EKF_one_correction_step  44.1   44.4  46.4 a
##  EKF_more_correction_step  64.3   65.5  68.6  b
##                       SMA 108.5  115.7 120.7   c
##                       GMA  50.8   55.3  56.1 ab
##                       UKF 221.4  222.6 223.8    d
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                       expr   lq median   uq cld
##   EKF_one_correction_step  229    335  352 a
##  EKF_more_correction_step  382    387  390 a
##                       SMA  737    812  829  b
##                       GMA  293    296  392 a
```

```
##                       UKF 1032   1036 1099   c
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                      expr    lq median    uq  cld
##   EKF_one_correction_step 111.0  117.9 126.9  b
##  EKF_more_correction_step  92.4   94.0  95.0 a
##                       SMA 201.6  204.0 212.1   c
##                       GMA  86.1   88.7  89.6 a
##                       UKF 489.6  495.0 504.4    d
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                      expr    lq median    uq  cld
##   EKF_one_correction_step  85.9   94.3  95.7 a
##  EKF_more_correction_step 165.7  178.0 178.4  b
##                       SMA 370.8  397.3 451.0   c
##                       GMA 136.3  139.8 140.2 ab
##                       UKF 567.5  575.0 582.7    d
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                      expr   lq median   uq   cld
##   EKF_one_correction_step  269    362  366 a
##  EKF_more_correction_step  576    581  593   c
##                       SMA 1082   1106 1112    d
##                       GMA  471    471  497  b
##                       UKF 2056   2057 2119     e
```

Session info

- R version 3.4.0 (2017-04-21), `x86_64-w64-mingw32`
- Locale: `LC_COLLATE=English_United Kingdom.1252`, `LC_CTYPE=English_United Kingdom.1252`, `LC_MONETARY=English_United Kingdom.1252`, `LC_NUMERIC=C`, `LC_TIME=English_United Kingdom.1252`
- Running under: `Windows 10 x64 (build 15063)`
- Matrix products: default
- Base packages: base, datasets, graphics, grDevices, methods, stats, utils
- Other packages: dynamichazard 0.3.4, microbenchmark 1.4-2.1, survival 2.41-3
- Loaded via a namespace (and not attached): backports 1.1.0, boot 1.3-19, codetools 0.2-15, colorspace 1.3-2, compiler 3.4.0, data.table 1.10.4, digest 0.6.12, evaluate 0.10, ggplot2 2.2.1, grid 3.4.0, gtable 0.2.0, htmltools 0.3.6, knitr 1.16, lattice 0.20-35, lazyeval 0.2.0, magrittr 1.5, MASS 7.3-47, Matrix 1.2-9, multcomp 1.4-6, munsell 0.4.3, mvtnorm 1.0-6, plyr 1.8.4, Rcpp 0.12.11, rlang 0.1.1, rmarkdown 1.5, rprojroot 1.2, sandwich 2.3-4, scales 0.4.1, speedglm 0.3-2, splines 3.4.0, stringi 1.1.5, stringr 1.2.0, TH.data 1.0-8, tibble 1.3.3, tools 3.4.0, yaml 2.1.14, zoo 1.8-0