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  65.3   75.5  78.5
##   EKF_more_correction_step 127.4  139.1 142.8
##                        SMA 195.3  202.7 222.0
##                        GMA 179.6  182.2 189.0
##                        UKF 322.7  323.5 327.3
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                       expr  lq median  uq
##    EKF_one_correction_step 227    235 241
##   EKF_more_correction_step 573    575 598
##                        SMA 637    648 663
##                        GMA 300    308 324
##                        UKF 595    597 637
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                       expr   lq median   uq
##    EKF_one_correction_step  664    716  717
##   EKF_more_correction_step 1422   1471 1857
##                        SMA 2598   2664 2687
##                        GMA 1231   1243 1243
##                        UKF 2862   2889 2911
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                       expr   lq median   uq
##    EKF_one_correction_step  149    151  181
##   EKF_more_correction_step  315    332  339
##                        SMA  582    582  601
##                        GMA  578    598  688
##                        UKF 1136   1144 1166
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                       expr  lq median   uq
##    EKF_one_correction_step 151    189  192
##   EKF_more_correction_step 320    328  344
##                        SMA 575    638  661
##                        GMA 310    339  381
##                        UKF 833    948 1028
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                       expr   lq median   uq
##    EKF_one_correction_step  531    589  607
##   EKF_more_correction_step 1049   1054 1129
##                        SMA 3206   3265 3296
##                        GMA 1127   1206 1215
##                        UKF 4175   4219 4272
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  346    358  382
##  EKF_more_correction_step  392    392  396
##                        SMA 1100   1110 1129
##                        GMA  482    692  722
##                        UKF 2439   2487 2510
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  250    256  260
##  EKF_more_correction_step  517    521  523
##                        SMA 1236   1353 1389
##                        GMA  515    516  517
##                        UKF 1833   1850 1883
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  558    631  673
##  EKF_more_correction_step 1135   1246 1281
##                        SMA 4314   4382 4977
##                        GMA 1275   1323 1513
##                        UKF 5332   5340 5862
```

Session info

- R version 3.4.2 (2017-09-28), `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 0.5.1, microbenchmark 1.4-2.1, survival 2.41-3
- Loaded via a namespace (and not attached): backports 1.1.0, boot 1.3-20, codetools 0.2-15, colorspace 1.3-2, compiler 3.4.2, data.table 1.10.4-2, digest 0.6.12, evaluate 0.10.1, ggplot2 2.2.1, grid 3.4.2, gtable 0.2.0, htmltools 0.3.6, knitr 1.17, lattice 0.20-35, lazyeval 0.2.0, magrittr 1.5, MASS 7.3-47, Matrix 1.2-11, multcomp 1.4-7, munsell 0.4.3, mvtnorm 1.0-6, parallel 3.4.2, plyr 1.8.4, Rcpp 0.12.13, rlang 0.1.4, rmarkdown 1.6, rprojroot 1.2, sandwich 2.4-0, scales 0.5.0, splines 3.4.2, stringi 1.1.5, stringr 1.2.0, TH.data 1.0-8, tibble 1.3.4, tools 3.4.2, yaml 2.1.14, zoo 1.8-0