speedtest

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2017-10-24

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))
```

```
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  57.8   69.6  72.6
##   EKF_more_correction_step 112.8  117.8 122.7
##                         SMA 182.2  186.4 192.5
##                         GMA 162.6  168.6 171.9
##                         UKF 214.6  215.0 218.6
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                         expr  lq median  uq
##    EKF_one_correction_step 196    196 198
##   EKF_more_correction_step 537    537 566
##                         SMA 517    548 556
##                         GMA 270    273 293
##                         UKF 464    467 474
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                         expr   lq median   uq
##    EKF_one_correction_step  417    495  525
##   EKF_more_correction_step  925    927  938
##                         SMA 2111   2114 2132
##                         GMA  667    679  690
##                         UKF 2280   2348 2352
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                         expr  lq median  uq
##    EKF_one_correction_step 120    129 145
##   EKF_more_correction_step 252    256 259
##                         SMA 421    442 510
##                         GMA 349    406 407
##                         UKF 606    610 634
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                         expr  lq median  uq
##    EKF_one_correction_step 138    149 155
##   EKF_more_correction_step 304    311 345
##                         SMA 546    601 611
##                         GMA 234    288 290
##                         UKF 722    725 747
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                         expr   lq median   uq
##    EKF_one_correction_step  495    599  619
##   EKF_more_correction_step 1114   1139 1163
##                         SMA 3091   3113 3165
##                         GMA  805    822  842
```

```
##                               UKF 3590    3593 3610
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                        expr   lq median   uq
##   EKF_one_correction_step  301    303  315
##  EKF_more_correction_step  324    336  344
##                         SMA  898    972  973
##                         GMA  415    427  435
##                         UKF 1190   1201 1211
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                        expr   lq median   uq
##   EKF_one_correction_step  244    247  251
##  EKF_more_correction_step  452    473  485
##                         SMA 1005   1077 1111
##                         GMA  366    378  379
##                         UKF 1134   1143 1145
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                        expr   lq median   uq
##   EKF_one_correction_step  545    552  562
##  EKF_more_correction_step 1018   1081 1094
##                         SMA 4057   4091 4188
##                         GMA  818    869  876
##                         UKF 4554   4596 4615
```

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 1.10.4-2, 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, parallel 3.4.1, plyr 1.8.4, Rcpp 0.12.13, 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