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 = 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))
```

```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  59.2   59.2  59.2
##  EKF_more_correction_step 106.6  106.6 106.6
##                       SMA 161.6  161.6 161.6
##                       GMA 166.0  166.0 166.0
##                       UKF 275.0  275.0 275.0
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                       expr  lq median  uq
##   EKF_one_correction_step 181    181 181
##  EKF_more_correction_step 519    519 519
##                       SMA 576    576 576
##                       GMA 273    273 273
##                       UKF 441    441 441
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  339    339  339
##  EKF_more_correction_step  835    835  835
##                       SMA 3839   3839 3839
##                       GMA  694    694  694
##                       UKF 2044   2044 2044
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                       expr    lq median    uq
##   EKF_one_correction_step  95.6   95.6  95.6
##  EKF_more_correction_step 216.2  216.2 216.2
##                       SMA 373.8  373.8 373.8
##                       GMA 301.8  301.8 301.8
##                       UKF 726.4  726.4 726.4
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                       expr  lq median  uq
##   EKF_one_correction_step 134    134 134
##  EKF_more_correction_step 293    293 293
##                       SMA 699    699 699
##                       GMA 178    178 178
##                       UKF 650    650 650
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  427    427  427
##  EKF_more_correction_step  879    879  879
##                       SMA 2712   2712 2712
##                       GMA  843    843  843
```

```
##                       UKF 3341   3341 3341
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  255    255  255
##  EKF_more_correction_step  282    282  282
##                       SMA  790    790  790
##                       GMA  371    371  371
##                       UKF 1751   1751 1751
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  208    208  208
##  EKF_more_correction_step  440    440  440
##                       SMA  889    889  889
##                       GMA  298    298  298
##                       UKF 1257   1257 1257
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  455    455  455
##  EKF_more_correction_step  950    950  950
##                       SMA 5796   5796 5796
##                       GMA 1226   1226 1226
##                       UKF 5214   5214 5214
```

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 0.5.3, 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