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")], 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  71.2   72.3  92.7
##  EKF_more_correction_step 127.7  128.2 131.8
##                       SMA 198.3  201.8 214.6
##                       GMA 193.2  194.5 198.9
##                       UKF 238.8  239.2 246.4
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                       expr  lq median  uq
##   EKF_one_correction_step 263    264 265
##  EKF_more_correction_step 703    722 750
##                       SMA 618    628 659
##                       GMA 332    339 348
##                       UKF 514    522 527
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  492    645  671
##  EKF_more_correction_step 1186   1200 1263
##                       SMA 2397   2470 2479
##                       GMA  788    795  856
##                       UKF 2652   2719 2727
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                       expr  lq median  uq
##   EKF_one_correction_step 129    135 136
##  EKF_more_correction_step 278    282 286
##                       SMA 485    490 504
##                       GMA 409    418 421
##                       UKF 633    686 715
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                       expr  lq median  uq
##   EKF_one_correction_step 164    168 170
##  EKF_more_correction_step 381    383 384
##                       SMA 583    619 651
##                       GMA 249    252 252
##                       UKF 749    775 821
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  548    679  693
##  EKF_more_correction_step 1260   1265 1363
##                       SMA 3385   3428 3431
##                       GMA  906    912  931
```

```
##                       UKF 3901   3924 4079
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  338    342  349
##  EKF_more_correction_step  393    393  407
##                       SMA 1047   1109 1140
##                       GMA  460    464  510
##                       UKF 1325   1328 1368
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  264    270  274
##  EKF_more_correction_step  531    543  553
##                       SMA 1132   1209 1332
##                       GMA  426    438  445
##                       UKF 1323   1381 1399
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  636    646  665
##  EKF_more_correction_step 1146   1255 1299
##                       SMA 4600   4702 4715
##                       GMA  904    965  981
##                       UKF 5229   5398 5560
```

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