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 = 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  65.6   65.6  65.6
##  EKF_more_correction_step 135.1  135.1 135.1
##                       SMA 182.0  182.0 182.0
##                       GMA 192.3  192.3 192.3
##                       UKF 290.9  290.9 290.9
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                       expr  lq median  uq
##    EKF_one_correction_step 188    188 188
##  EKF_more_correction_step 538    538 538
##                       SMA 613    613 613
##                       GMA 284    284 284
##                       UKF 485    485 485
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                       expr   lq median   uq
##    EKF_one_correction_step  378    378  378
##  EKF_more_correction_step  864    864  864
##                       SMA 2337   2337 2337
##                       GMA  799    799  799
##                       UKF 2350   2350 2350
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                       expr  lq median  uq
##    EKF_one_correction_step 118    118 118
##  EKF_more_correction_step 262    262 262
##                       SMA 436    436 436
##                       GMA 356    356 356
##                       UKF 839    839 839
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                       expr  lq median  uq
##    EKF_one_correction_step 135    135 135
##  EKF_more_correction_step 308    308 308
##                       SMA 502    502 502
##                       GMA 205    205 205
##                       UKF 778    778 778
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                       expr   lq median   uq
##    EKF_one_correction_step  435    435  435
##  EKF_more_correction_step  932    932  932
##                       SMA 3185   3185 3185
##                       GMA  942    942  942
```

```
##                           UKF 3837    3837 3837
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                         expr   lq median   uq
##    EKF_one_correction_step  285     285  285
##  EKF_more_correction_step  348     348  348
##                          SMA  938     938  938
##                          GMA  482     482  482
##                          UKF 2035    2035 2035
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                         expr   lq median   uq
##    EKF_one_correction_step  211     211  211
##  EKF_more_correction_step  445     445  445
##                          SMA  981     981  981
##                          GMA  337     337  337
##                          UKF 1379    1379 1379
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                         expr   lq median   uq
##    EKF_one_correction_step  401     401  401
##  EKF_more_correction_step  864     864  864
##                          SMA 3792    3792 3792
##                          GMA 1001    1001 1001
##                          UKF 4566    4566 4566
```

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 0.5.2, 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 0.12.16, 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