speedtest

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Setup

```r
library(dynamichazard); library(microbenchmark)
```

```
## Loading required package: survival
```

```
## Warning: package 'microbenchmark' was built under R version 3.5.1
```

```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))),
```

1

```r
    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

```r
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))
```

Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data = sims
$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

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(n, p) = (250, 5). Units is 'milliseconds'
expr   lq median   uq
EKF_one_correction_step 69.8   69.8 69.8
EKF_more_correction_step 140.7 140.7 140.7
SMA 185.7 185.7 185.7
GMA 273.3 273.3 273.3
UKF 272.5 272.5 272.5

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$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

(n, p) = (1000, 5). Units is 'milliseconds'
expr lq median uq
EKF_one_correction_step 269   269 269
EKF_more_correction_step 770   770 770
SMA 644   644 644
GMA 364   364 364
UKF 538   538 538

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Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data = sims
$res, : 'ddhazard_control' instead of 'list' to the 'control' argument

(n, p) = (10000, 5). Units is 'milliseconds'
expr   lq median   uq
EKF_one_correction_step 454   454 454
EKF_more_correction_step 1281   1281 1281
```

```
##                              SMA 2585    2585 2585
##                              GMA  931     931  931
##                              UKF 2791    2791 2791

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data = sims
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## (n, p) = (250, 10). Units is 'milliseconds'
##                         expr  lq median   uq
##    EKF_one_correction_step  145    145  145
##   EKF_more_correction_step  311    311  311
##                        SMA  511    511  511
##                        GMA  601    601  601
##                        UKF 1077   1077 1077

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## (n, p) = (1000, 10). Units is 'milliseconds'
##                         expr  lq median  uq
##    EKF_one_correction_step  180    180 180
##   EKF_more_correction_step  368    368 368
##                        SMA  574    574 574
##                        GMA  280    280 280
##                        UKF  859    859 859

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data = sims
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## $res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## (n, p) = (10000, 10). Units is 'milliseconds'
##                         expr   lq median   uq
##    EKF_one_correction_step  557    557  557
##   EKF_more_correction_step 1099   1099 1099
##                        SMA 2746   2746 2746
```

```
##                           GMA 1116     1116 1116
##                           UKF 4232     4232 4232

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data = sims
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## (n, p) = (250, 15). Units is 'milliseconds'
##                          expr   lq median   uq
##   EKF_one_correction_step  317    317  317
##  EKF_more_correction_step  371    371  371
##                           SMA 1445   1445 1445
##                           GMA  557    557  557
##                           UKF 1876   1876 1876

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## (n, p) = (1000, 15). Units is 'milliseconds'
##                          expr   lq median   uq
##   EKF_one_correction_step  216    216  216
##  EKF_more_correction_step  476    476  476
##                           SMA  827    827  827
##                           GMA  355    355  355
##                           UKF 1310   1310 1310

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## $res, : 'ddhazard_control' instead of 'list' to the 'control' argument

## (n, p) = (10000, 15). Units is 'milliseconds'
##                          expr   lq median   uq
##   EKF_one_correction_step  450    450  450
##  EKF_more_correction_step 1132   1132 1132
##                           SMA 3517   3517 3517
##                           GMA  980    980  980
```

```
##                        UKF 4398    4398 4398
```

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 0.6.1, microbenchmark 1.4-6, 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 1.0.0, rmarkdown 1.10, rprojroot 1.3-2, splines 3.5.0, stringi 1.1.7, stringr 1.3.0, tools 3.5.0, yaml 2.1.18