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))
```

```
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 52.4   52.4 52.4
EKF_more_correction_step 110.5 110.5 110.5
SMA 171.6 171.6 171.6
GMA 161.6 161.6 161.6
UKF 300.0 300.0 300.0

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(n, p) = (1000, 5). Units is 'milliseconds'
expr lq median uq
EKF_one_correction_step 194   194 194
EKF_more_correction_step 625   625 625
SMA 590   590 590
GMA 284   284 284
UKF 549   549 549

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$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 385   385 385
EKF_more_correction_step 894   894 894
SMA 1970   1970 1970
```

```
##                             GMA  784    784  784
##                             UKF 2171   2171 2171

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## (n, p) = (250, 10). Units is 'milliseconds'
##                        expr    lq median    uq
##   EKF_one_correction_step  94.8   94.8  94.8
##  EKF_more_correction_step 204.5  204.5 204.5
##                        SMA 387.2  387.2 387.2
##                        GMA 300.0  300.0 300.0
##                        UKF 779.5  779.5 779.5

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## (n, p) = (1000, 10). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 138    138 138
##  EKF_more_correction_step 300    300 300
##                        SMA 438    438 438
##                        GMA 201    201 201
##                        UKF 695    695 695

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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 436    436  436
##  EKF_more_correction_step 960    960  960
##                        SMA 2720   2720 2720
##                        GMA 919    919  919
```

```
##                     UKF 4099    4099 4099

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## (n, p) = (250, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##    EKF_one_correction_step  256    256  256
##  EKF_more_correction_step  290    290  290
##                        SMA  789    789  789
##                        GMA  359    359  359
##                        UKF 1928   1928 1928

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## (n, p) = (1000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##    EKF_one_correction_step  206    206  206
##  EKF_more_correction_step  435    435  435
##                        SMA  802    802  802
##                        GMA  285    285  285
##                        UKF 1359   1359 1359

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## (n, p) = (10000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##    EKF_one_correction_step  386    386  386
##  EKF_more_correction_step  896    896  896
##                        SMA 3537   3537 3537
##                        GMA  932    932  932
##                        UKF 4352   4352 4352
```

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 0.6.0, 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 0.12.18, 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