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))
```

```
invisible(
  mapply(get_rune_time_summary, n = grid_vals$n, p = grid_vals$p))
```

```
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## $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  60.5   60.5  60.5
##  EKF_more_correction_step 111.4  111.4 111.4
##                       SMA 166.6  166.6 166.6
##                       GMA 168.4  168.4 168.4
##                       UKF 307.0  307.0 307.0

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## (n, p) = (1000, 5). Units is 'milliseconds'
##                       expr  lq median  uq
##   EKF_one_correction_step 189    189 189
##  EKF_more_correction_step 535    535 535
##                       SMA 552    552 552
##                       GMA 258    258 258
##                       UKF 469    469 469

## 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, 5). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  364    364  364
##  EKF_more_correction_step  849    849  849
##                       SMA 1987   1987 1987
```

```
##                      GMA  763    763  763
##                      UKF 2092   2092 2092

## Warning in ddhazard(formula = Surv(tstart, tstop, event) ~ . - id, data = sims
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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) = (250, 10). Units is 'milliseconds'
##                     expr    lq median    uq
##   EKF_one_correction_step  95.7   95.7  95.7
##  EKF_more_correction_step 240.3  240.3 240.3
##                      SMA 376.0  376.0 376.0
##                      GMA 306.6  306.6 306.6
##                      UKF 772.4  772.4 772.4

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## (n, p) = (1000, 10). Units is 'milliseconds'
##                     expr  lq median  uq
##   EKF_one_correction_step 133    133 133
##  EKF_more_correction_step 295    295 295
##                      SMA 446    446 446
##                      GMA 186    186 186
##                      UKF 679    679 679

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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  422    422  422
##  EKF_more_correction_step  947    947  947
##                      SMA 2718   2718 2718
##                      GMA  906    906  906
```

```
##                       UKF 3592   3592 3592
```

```
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## (n, p) = (250, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  252    252  252
##  EKF_more_correction_step  292    292  292
##                       SMA  786    786  786
##                       GMA  391    391  391
##                       UKF 1915   1915 1915

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

## (n, p) = (1000, 15). Units is 'milliseconds'
##                      expr   lq median   uq
##   EKF_one_correction_step  209    209  209
##  EKF_more_correction_step  435    435  435
##                       SMA 1172   1172 1172
##                       GMA  290    290  290
##                       UKF 1451   1451 1451

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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  400    400  400
##  EKF_more_correction_step  876    876  876
##                       SMA 3642   3642 3642
##                       GMA  960    960  960
##                       UKF 4430   4430 4430
```

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