speedtest

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2018-10-22

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))
```

```
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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  61.2   61.2  61.2
##  EKF_more_correction_step 131.8  131.8 131.8
##                       SMA 195.9  195.9 195.9
##                       GMA 196.6  196.6 196.6
##                       UKF 318.8  318.8 318.8

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## (n, p) = (1000, 5). Units is 'milliseconds'
##                          expr  lq median  uq
##    EKF_one_correction_step 193     193 193
##  EKF_more_correction_step 615     615 615
##                       SMA 614     614 614
##                       GMA 295     295 295
##                       UKF 580     580 580

## 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 399     399  399
##  EKF_more_correction_step 928     928  928
##                       SMA 2381    2381 2381
```

```
##                            GMA  891    891  891
##                            UKF 2543   2543 2543

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## $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 124    124 124
##  EKF_more_correction_step 257    257 257
##                       SMA 471    471 471
##                       GMA 353    353 353
##                       UKF 909    909 909

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## (n, p) = (1000, 10). Units is 'milliseconds'
##                       expr  lq median  uq
##   EKF_one_correction_step 149    149 149
##  EKF_more_correction_step 299    299 299
##                       SMA 526    526 526
##                       GMA 218    218 218
##                       UKF 817    817 817

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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 438    438  438
##  EKF_more_correction_step 984    984  984
##                       SMA 3131   3131 3131
##                       GMA 1085   1085 1085
```

```
##                          UKF 4241    4241 4241
## 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) = (250, 15). Units is 'milliseconds'
##                          expr   lq median   uq
##   EKF_one_correction_step  295     295  295
##  EKF_more_correction_step  324     324  324
##                       SMA  916     916  916
##                       GMA  461     461  461
##                       UKF 2222    2222 2222

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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  214     214  214
##  EKF_more_correction_step  487     487  487
##                       SMA  995     995  995
##                       GMA  352     352  352
##                       UKF 1606    1606 1606

## 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, 15). Units is 'milliseconds'
##                          expr   lq median   uq
##   EKF_one_correction_step  453     453  453
##  EKF_more_correction_step 1036    1036 1036
##                       SMA 4271    4271 4271
##                       GMA 1197    1197 1197
##                       UKF 5260    5260 5260
```

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 1.4-4, 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