

speedtest

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2018-10-01

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))

## 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 138.9  138.9 138.9
##           SMA 201.2   201.2 201.2
##           GMA 216.8   216.8 216.8
##           UKF 339.8   339.8 339.8

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## (n, p) = (1000, 5). Units is 'milliseconds'
##           expr    lq median    uq
## EKF_one_correction_step 210     210 210
## EKF_more_correction_step 546     546 546
##           SMA 662     662 662
##           GMA 300     300 300
##           UKF 555     555 555

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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 403     403 403
## EKF_more_correction_step 960     960 960
##           SMA 2532    2532 2532
```

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##          GMA  940    940  940
##          UKF 2670   2670 2670

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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 120    120 120
## EKF_more_correction_step 292    292 292
##          SMA  476    476 476
##          GMA  389    389 389
##          UKF 1006   1006 1006

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## (n, p) = (1000, 10). Units is 'milliseconds'
##          expr  lq median  uq
## EKF_one_correction_step 137    137 137
## EKF_more_correction_step 300    300 300
##          SMA  551    551 551
##          GMA  255    255 255
##          UKF  842    842 842

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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 480    480 480
## EKF_more_correction_step 1057   1057 1057
##          SMA 3725   3725 3725
##          GMA 1103   1103 1103

```

```

##                                UKF 4360   4360 4360

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## (n, p) = (250, 15). Units is 'milliseconds'
##           expr    lq median    uq
## EKF_one_correction_step 333    333 333
## EKF_more_correction_step 373    373 373
##           SMA 1098    1098 1098
##           GMA 494    494 494
##           UKF 2605    2605 2605

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## (n, p) = (1000, 15). Units is 'milliseconds'
##           expr    lq median    uq
## EKF_one_correction_step 224    224 224
## EKF_more_correction_step 475    475 475
##           SMA 1221    1221 1221
##           GMA 389    389 389
##           UKF 1780    1780 1780

## 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 484    484 484
## EKF_more_correction_step 1301   1301 1301
##           SMA 5036    5036 5036
##           GMA 1291    1291 1291
##           UKF 6321    6321 6321

```

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