

speedtest

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2018-12-10

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 72.1   72.1 72.1
## EKF_more_correction_step 154.8  154.8 154.8
##           SMA 192.7   192.7 192.7
##           GMA 295.2   295.2 295.2
##           UKF 337.1   337.1 337.1

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## (n, p) = (1000, 5). Units is 'milliseconds'
##           expr    lq median    uq
## EKF_one_correction_step 295     295 295
## EKF_more_correction_step 768     768 768
##           SMA 618     618 618
##           GMA 390     390 390
##           UKF 531     531 531

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## (n, p) = (10000, 5). Units is 'milliseconds'
##           expr    lq median    uq
## EKF_one_correction_step 541     541 541
## EKF_more_correction_step 1352    1352 1352
##           SMA 2806    2806 2806
```

```

##                GMA 1085    1085 1085
##                UKF 2988    2988 2988

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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 137    137 137
## EKF_more_correction_step 357    357 357
##                SMA 462    462 462
##                GMA 563    563 563
##                UKF 932    932 932

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## (n, p) = (1000, 10). Units is 'milliseconds'
##                expr  lq median  uq
## EKF_one_correction_step 156    156 156
## EKF_more_correction_step 343    343 343
##                SMA 509    509 509
##                GMA 264    264 264
##                UKF 857    857 857

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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 591    591 591
## EKF_more_correction_step 1349   1349 1349
##                SMA 5270   5270 5270
##                GMA 1175   1175 1175

```

```

##                                UKF 5591    5591 5591

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## (n, p) = (250, 15). Units is 'milliseconds'
##              expr    lq median    uq
## EKF_one_correction_step 292    292 292
## EKF_more_correction_step 326    326 326
##              SMA    915    915 915
##              GMA    571    571 571
##              UKF 2219    2219 2219

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## (n, p) = (1000, 15). Units is 'milliseconds'
##              expr    lq median    uq
## EKF_one_correction_step 231    231 231
## EKF_more_correction_step 550    550 550
##              SMA    970    970 970
##              GMA    408    408 408
##              UKF 1585    1585 1585

## 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 489    489 489
## EKF_more_correction_step 1159    1159 1159
##              SMA 4214    4214 4214
##              GMA 1143    1143 1143
##              UKF 5124    5124 5124

```

Session info

- R version 3.5.1 (2018-07-02), 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 2.42-3
- Loaded via a namespace (and not attached): backports 1.1.2, boot 1.3-20, compiler 3.5.1, digest 0.6.15, evaluate 0.10.1, grid 3.5.1, htmltools 0.3.6, knitr 1.20, lattice 0.20-35, magrittr 1.5, Matrix 1.2-14, parallel 3.5.1, Rcpp 1.0.0, rmarkdown 1.10, rprojroot 1.3-2, splines 3.5.1, stringi 1.1.7, stringr 1.3.0, tools 3.5.1, yaml 2.1.18