

speedtest

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2018-06-25

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))
```

```
## (n, p) = (250, 5). Units is 'milliseconds'
##           expr    lq median    uq
## EKF_one_correction_step  63.4   63.4  63.4
## EKF_more_correction_step 125.7  125.7 125.7
##           SMA 172.1  172.1 172.1
##           GMA 180.5  180.5 180.5
##           UKF 288.2  288.2 288.2
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##           expr    lq median    uq
## EKF_one_correction_step  185    185 185
## EKF_more_correction_step 537    537 537
##           SMA 566    566 566
##           GMA 257    257 257
##           UKF 504    504 504
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##           expr    lq median    uq
## EKF_one_correction_step  378    378 378
## EKF_more_correction_step 858    858 858
##           SMA 2194   2194 2194
##           GMA 766    766 766
##           UKF 2168   2168 2168
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##           expr    lq median    uq
## EKF_one_correction_step  98.2   98.2 98.2
## EKF_more_correction_step 254.0  254.0 254.0
##           SMA 409.4  409.4 409.4
##           GMA 332.2  332.2 332.2
##           UKF 768.4  768.4 768.4
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##           expr    lq median    uq
## EKF_one_correction_step  138    138 138
## EKF_more_correction_step 308    308 308
##           SMA 477    477 477
##           GMA 203    203 203
##           UKF 704    704 704
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##           expr    lq median    uq
## EKF_one_correction_step  438    438 438
## EKF_more_correction_step 914    914 914
##           SMA 2980   2980 2980
##           GMA 902    902 902
```

```

##           UKF 3550   3550 3550
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##           expr   lq median   uq
##   EKF_one_correction_step 263   263 263
##   EKF_more_correction_step 293   293 293
##           SMA 1106   1106 1106
##           GMA 391    391 391
##           UKF 1897   1897 1897
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##           expr   lq median   uq
##   EKF_one_correction_step 186   186 186
##   EKF_more_correction_step 439   439 439
##           SMA 881    881 881
##           GMA 310    310 310
##           UKF 1359   1359 1359
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##           expr   lq median   uq
##   EKF_one_correction_step 405   405 405
##   EKF_more_correction_step 857   857 857
##           SMA 5230   5230 5230
##           GMA 997    997 997
##           UKF 4502   4502 4502
##

```

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 0.5.2, 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 0.12.16, 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