

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 = 5
))

cat("(n, p) = (", n, ", ", p, ")",
    ". Units is ", sQuote(attr(out, "unit")), "\n", sep = "")

print(out[, c("expr", "lq", "median", "uq", "cld")], 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 cld
## EKF_one_correction_step 19.1   22.1 24.9  a
## EKF_more_correction_step 36.6   39.6 44.6  a
##      SMA 85.1   91.3 95.6  a
##      GMA 33.7   35.1 36.4  a
##      UKF 76.6   80.5 81.1  a
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##      expr    lq median    uq cld
## EKF_one_correction_step 32.6   32.9 35.2  a
## EKF_more_correction_step 60.8   62.3 63.2  b
##      SMA 59.9   60.2 63.3  b
##      GMA 40.6   45.7 46.5  a
##      UKF 99.6  107.5 109.2  c
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##      expr    lq median    uq cld
## EKF_one_correction_step 156    253 277  a
## EKF_more_correction_step 336    350 426  b
##      SMA 499    595 600  c
##      GMA 195    221 297  a
##      UKF 614    664 667  c
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##      expr    lq median    uq cld
## EKF_one_correction_step 44.8   47.9 52.8  a
## EKF_more_correction_step 83.8   86.0 87.4  b
##      SMA 141.9 142.1 144.7  c
##      GMA 67.4   67.7 83.8  b
##      UKF 358.4 367.0 369.9  d
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##      expr    lq median    uq cld
## EKF_one_correction_step 45.2   45.3 46.8  a
## EKF_more_correction_step 62.0   66.0 72.3  b
##      SMA 118.1 135.7 137.8  c
##      GMA 52.8   54.8 54.9  ab
##      UKF 212.2 213.6 217.2  d
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##      expr    lq median    uq cld
## EKF_one_correction_step 317    326 329  a
## EKF_more_correction_step 398    414 501  b
##      SMA 791    792 805  c
##      GMA 370    376 378  a
```

```

##           UKF 1075   1077 1085    d
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##           expr    lq median    uq  cld
##   EKF_one_correction_step 106.1  106.2 106.9  b
##   EKF_more_correction_step  91.3   93.0  98.4 ab
##           SMA 181.8  187.3 190.3   c
##           GMA  81.3   83.7  92.3  a
##           UKF 462.2  462.7 478.2   d
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##           expr    lq median    uq  cld
##   EKF_one_correction_step  86.8   86.8  90.1  a
##   EKF_more_correction_step 163.1  163.2 179.1  b
##           SMA 375.8  432.2 455.9   c
##           GMA 119.6  120.0 129.7 ab
##           UKF 535.2  541.8 543.3   d
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##           expr    lq median    uq  cld
##   EKF_one_correction_step  273    350  363  a
##   EKF_more_correction_step  516    580  597  b
##           SMA 1115   1142 1157   c
##           GMA  388    446  493 ab
##           UKF 2039   2087 2153   d

```

Session info

- R version 3.4.1 (2017-06-30), x86_64-w64-mingw32
- Locale: LC_COLLATE=English_United Kingdom.1252, LC_CTYPE=English_United Kingdom.1252, LC_MONETARY=English_United Kingdom.1252, LC_NUMERIC=C, LC_TIME=English_United Kingdom.1252
- Running under: Windows 10 x64 (build 15063)
- Matrix products: default
- Base packages: base, datasets, graphics, grDevices, methods, stats, utils
- Other packages: dynamichazard 0.3.5, microbenchmark 1.4-2.1, survival 2.41-3
- Loaded via a namespace (and not attached): backports 1.1.0, boot 1.3-19, codetools 0.2-15, colorspace 1.3-2, compiler 3.4.1, data.table 1.10.4, digest 0.6.12, evaluate 0.10, ggplot2 2.2.1, grid 3.4.1, gtable 0.2.0, htmltools 0.3.6, knitr 1.16, lattice 0.20-35, lazyeval 0.2.0, magrittr 1.5, MASS 7.3-47, Matrix 1.2-10, multcomp 1.4-6, munsell 0.4.3, mvtnorm 1.0-6, plyr 1.8.4, Rcpp 0.12.12, rlang 0.1.1, rmarkdown 1.5, rprojroot 1.2, sandwich 2.3-4, scales 0.4.1, speedglm 0.3-2, splines 3.4.1, stringi 1.1.5, stringr 1.2.0, TH.data 1.0-8, tibble 1.3.3, tools 3.4.1, yaml 2.1.14, zoo 1.8-0