speedtest

Benjamin Christoffersen

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Setup

```
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 = 5
  ))

  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  57.8   58.7  62.2
##  EKF_more_correction_step 108.3  109.4 111.2
##                       SMA 188.4  191.3 193.2
##                       GMA 172.4  177.4 186.4
##                       UKF 261.7  276.6 279.7
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 175    179 182
##  EKF_more_correction_step 498    503 506
##                       SMA 548    586 595
##                       GMA 254    256 261
##                       UKF 467    468 469
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                        expr   lq median   uq
##   EKF_one_correction_step  341    345  349
##  EKF_more_correction_step  846    859  864
##                       SMA 2264   2296 4100
##                       GMA  760    761  785
##                       UKF 2130   2151 2261
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 101    102 105
##  EKF_more_correction_step 232    233 233
##                       SMA 410    415 420
##                       GMA 327    333 366
##                       UKF 779    788 805
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 134    135 140
##  EKF_more_correction_step 297    297 301
##                       SMA 521    529 589
##                       GMA 196    198 209
##                       UKF 715    721 732
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                        expr   lq median   uq
##   EKF_one_correction_step  455    509  526
##  EKF_more_correction_step  901    901  915
##                       SMA 4641   4662 4711
##                       GMA 1003   1004 1005
```

```
##                                  UKF 3471    3557 3572
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                          expr   lq median   uq
##    EKF_one_correction_step  272     283  287
##  EKF_more_correction_step  314     328  334
##                           SMA  976    1004 1278
##                           GMA  426     445  446
##                           UKF 1926    1943 1955
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                          expr   lq median   uq
##    EKF_one_correction_step  211     212  212
##  EKF_more_correction_step  443     451  459
##                           SMA 1124    1313 1541
##                           GMA  310     326  359
##                           UKF 1488    1491 1495
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                          expr   lq median   uq
##    EKF_one_correction_step  395     408  486
##  EKF_more_correction_step  886     901  946
##                           SMA 3809    3817 3884
##                           GMA 1000    1011 1014
##                           UKF 4505    4528 4537
```

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