speedtest

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2018-06-22

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(
```

```r
        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

```r
grid_vals <- expand.grid(
  n = c(250, 1000, 10000),
  p = c(5, 10, 15))
```

```r
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  62   67.4  70.2
##  EKF_more_correction_step 116  117.8 123.1
##                       SMA 178  183.6 199.1
##                       GMA 183  184.2 196.6
##                       UKF 255  258.6 264.2
##
##
## (n, p) = (1000, 5). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 199    199 228
##  EKF_more_correction_step 540    556 563
##                       SMA 586    588 600
##                       GMA 263    275 278
##                       UKF 495    497 508
##
##
## (n, p) = (10000, 5). Units is 'milliseconds'
##                        expr   lq median   uq
##   EKF_one_correction_step  394    429  441
##  EKF_more_correction_step  944    986 1012
##                       SMA 2350   2700 3014
##                       GMA  812    844  887
##                       UKF 2341   2346 2405
##
##
## (n, p) = (250, 10). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 105    117 123
##  EKF_more_correction_step 249    256 263
##                       SMA 442    451 524
##                       GMA 351    361 375
##                       UKF 879    881 885
##
##
## (n, p) = (1000, 10). Units is 'milliseconds'
##                        expr  lq median  uq
##   EKF_one_correction_step 130    136 137
##  EKF_more_correction_step 286    286 290
##                       SMA 546    549 775
##                       GMA 206    216 218
##                       UKF 736    738 808
##
##
## (n, p) = (10000, 10). Units is 'milliseconds'
##                        expr   lq median   uq
##   EKF_one_correction_step  508    555  565
##  EKF_more_correction_step 1095   1157 1166
##                       SMA 3196   3276 4995
##                       GMA 1025   1027 1066
##                        UKF 3834   3872 3945
##
##
## (n, p) = (250, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  268    269  284
##  EKF_more_correction_step  309    313  315
##                        SMA  915    921  935
##                        GMA  406    414  438
##                        UKF 1952   2032 2046
##
##
## (n, p) = (1000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  204    210  217
##  EKF_more_correction_step  464    469  477
##                        SMA  993   1108 1154
##                        GMA  328    332  337
##                        UKF 1423   1445 1534
##
##
## (n, p) = (10000, 15). Units is 'milliseconds'
##                       expr   lq median   uq
##   EKF_one_correction_step  441    470  561
##  EKF_more_correction_step 1071   1133 1174
##                        SMA 4197   4309 4405
##                        GMA 1109   1118 1122
##                        UKF 5040   5186 5216
```

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