

# Multievent capture-recapture with Rcpp

*Olivier Gimenez*

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```
Rcpp::sourceCpp('multievent.cpp')

##
## > set.seed(1)
##
## > data = read.table("titis2.txt")
##
## > nh <- dim(data)[1]
##
## > k <- dim(data)[2]
##
## > km1 <- k - 1
##
## > eff <- rep(1, nh)
##
## > fc <- NULL
##
## > init.state <- NULL
##
## > for (i in 1:nh) {
## +   temp <- 1:k
## +   fc <- c(fc, min(which(data[i, ] != 0)))
## +   init.state <- c(init.state, data[i, fc[i]])
## + }
##
## > binit <- runif(9)
##
## > data <- t(data)
##
## > devMULTIEVENT <- function(b, data, eff, e, garb, nh,
## +   km1) {
## +   par = plogis(b)
## +   piNB <- par[1]
## +   phiNB <- par[2]
## +   phiB <- pa .... [TRUNCATED]
##
## > devMULTIEVENT(binit, data, eff, fc, init.state, nh,
## +   km1)
## [1] 4119.899
##
## > multieventrcpp(binit, data, fc, init.state)
## [1] 4119.899
##
## > deb = Sys.time()
##
## > tmpmin1 <- optim(binit, devMULTIEVENT, NULL, hessian = T,
## +   data, eff, fc, init.state, nh, km1, method = "BFGS", control = list(trace = 1,
```

```

## + .... [TRUNCATED]
## initial value 4119.899014
## iter 2 value 3791.978663
## iter 3 value 3743.667012
## iter 4 value 3722.924618
## iter 5 value 3708.754845
## iter 6 value 3676.624421
## iter 7 value 3652.330086
## iter 8 value 3637.077009
## iter 9 value 3633.102388
## iter 10 value 3609.352003
## iter 11 value 3589.298910
## iter 12 value 3575.517392
## iter 13 value 3556.214533
## iter 14 value 3550.106042
## iter 15 value 3546.965578
## iter 16 value 3545.964026
## iter 17 value 3539.241500
## iter 18 value 3534.961470
## iter 19 value 3533.719953
## iter 20 value 3532.736792
## iter 21 value 3532.584707
## iter 22 value 3532.518436
## iter 23 value 3532.473397
## iter 24 value 3532.431304
## iter 25 value 3532.400208
## iter 26 value 3532.395217
## iter 27 value 3532.377326
## iter 28 value 3532.363019
## iter 29 value 3532.349731
## iter 30 value 3532.344433
## iter 31 value 3532.334617
## iter 32 value 3532.334559
## iter 32 value 3532.334558
## iter 32 value 3532.334558
## final value 3532.334558
## converged
##
## > fin = Sys.time()
##
## > res1 = fin - deb
##
## > deb = Sys.time()
##
## > tmpmin2 <- optim(binit, multieventrcpp, NULL, hessian = T,
## + data, fc, init.state, method = "BFGS", control = list(trace = 1,
## + REPORT .... [TRUNCATED]
## initial value 4119.899014
## iter 2 value 3791.978663
## iter 3 value 3743.667012
## iter 4 value 3722.924618
## iter 5 value 3708.754845
## iter 6 value 3676.624421
## iter 7 value 3652.330086

```

```

## iter    8 value 3637.077009
## iter    9 value 3633.102388
## iter   10 value 3609.352003
## iter   11 value 3589.298911
## iter   12 value 3575.517392
## iter   13 value 3556.214533
## iter   14 value 3550.106042
## iter   15 value 3546.965578
## iter   16 value 3545.964026
## iter   17 value 3539.241500
## iter   18 value 3534.961470
## iter   19 value 3533.719953
## iter   20 value 3532.736792
## iter   21 value 3532.584707
## iter   22 value 3532.518436
## iter   23 value 3532.473397
## iter   24 value 3532.431304
## iter   25 value 3532.400208
## iter   26 value 3532.395217
## iter   27 value 3532.377326
## iter   28 value 3532.363019
## iter   29 value 3532.349731
## iter   30 value 3532.344433
## iter   31 value 3532.334617
## iter   32 value 3532.334559
## iter   32 value 3532.334558
## iter   32 value 3532.334558
## final   value 3532.334558
## converged
##
## > fin = Sys.time()
##
## > res2 = fin - deb
##
## > res1
## Time difference of 10.36431 secs
##
## > tmpmin1$par
## [1]  0.8674528  1.4764532  1.6396689 -1.2691570 -1.2283542  0.2600259
## [7]  0.3959696 -1.4643768  1.0333858
##
## > res2
## Time difference of 0.954143 secs
##
## > tmpmin2$par
## [1]  0.8674528  1.4764532  1.6396689 -1.2691570 -1.2283542  0.2600259
## [7]  0.3959696 -1.4643768  1.0333858

```