README

ddd

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multicmp

multicmp is a toolkit containing statistical analysis models motivated by multivariate forms of the Conway-Maxwell-Poisson (COM-Poisson) distribution for flexible modeling of multivariate count data, especially in the presence of data dispersion, via the bivariate COM-Poisson distribution described in Sellers et al. (2016). Currently the package only supports bivariate data. Future development will extend the package to higher-dimensional data.

To use multicmp, one will first need to install the following two packages:

```
  install.packages("numDeriv")
  install.packages("stats")
```

One can install the latest released version of multicmp from CRAN with:

```
  install.packages("multicmp")
```

Using multicmp

To get started with multicmp right away, see the parameter estimation below. For a more detailed and technical description of the bivariate COM-Poisson distribution, see Sellers et al. (2016).

The multicmp package houses the *accidents* data set (Arbous and Kerrich, 1951)

```
## Warning: package 'numDeriv' was built under R version 3.3.2
```

```
  data(accidents)
```

```
ComputeConstantBCMPests(accidents, 100, startvalues = c(1.3, .08 , .25 , .25 , .25 , .25))
```

```
## Iterating...
##   0:     739.45623:  1.30000 0.0800000 0.250000 0.250000 0.250000 0.250000
##  10:     341.83204:  1.34607 0.514655 0.139933 0.928807 0.695243 0.0875173
##  20:     341.78510:  1.57191 0.427111 0.941226 0.753154 0.564704 0.0519306
##  30:     341.74099:  1.66876 0.244892  1.81058 0.284172 0.213532 0.0187175
##  40:     341.72969:  1.57762 0.184585  1.81237 0.179606 0.135145 0.0117687
##  50:     341.71759:  1.42320 0.114266  1.69515 0.0840200 0.0630426 0.00601499
##  60:     341.70384:  1.32822 0.0837986  1.58309 0.0569687 0.0428491 0.00384228
##
##  The parameter estimates ($par) and standard errors ($se) are as follows:
##  Parameter        MLE          SE
##     lambda 1.32843737 4.903721e-01
##         nu 0.08385888 1.267377e-01
##        p00 0.93850364 3.875811e+04
##        p10 0.03380257 1.395953e+03
##        p01 0.02542462 1.049968e+03
##        p11 0.00226917 9.370670e+01
##
##  Log-likelihood ($negll): 341.7038
```

```
##
##  Dispersion hypothesis test statistic ($LRT_bpd) and p-value ($p_bpd):
##  Likelihood.ratio.test     p.value
##               7.862468 0.005047146
```