LGCP with PC priors

Patrick Brown

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```r
library('mapmisc')
library("geostatsp")
data('murder')
data('torontoPop')
```

```r
if(requireNamespace("rgdal") & requireNamespace("rgeos")) {
        murderT = spTransform(murder, omerc(murder, angle=-20))
        borderT = spTransform(torontoBorder, projection(murderT))
        borderC = crop(borderT, extent(-12700, 7000, -7500, 3100))
}

## Loading required namespace:  rgeos

covList = list(
                pop=torontoPdens,
                inc = log(torontoIncome) )

formulaHere = ~ inc + offset(pop, log=TRUE)
```

LGCP with priors given by quantiles

```r
if(requireNamespace("rgdal") & requireNamespace("rgeos") & requireNamespace("INLA")) {
        resG=lgcp(
                formula = formulaHere,
                data=murderT,
                        grid=squareRaster(borderC, 30),
                        covariates=covList,
                        border=borderC, buffer=2000,
                        prior = list(
```

```
                               sd = c(lower = 0.2, upper = 2),
                               range = c(lower = 2, upper=20)*1000),
                    control.inla=list(strategy='gaussian')
        )
} else {
        resG = NULL
}

## Loading required namespace:  INLA
```

LGCP with penalised complexity prior

$pr(sd > 1) = 0.05$ and $pr(phi < 0.2) = 0.95$

```
if(requireNamespace("rgdal") & requireNamespace("rgeos") & requireNamespace("INLA")) {
        resP=lgcp(formulaHere, data=murderT,
                    grid=squareRaster(borderC, 30),
                    covariates=covList,
                    border=borderC, buffer=2000,
                    prior = list(
                            sd = c(u=0.5, alpha=0.05),
                            range = c(u=10*1000, alpha = 0.4)),
                    control.inla = list(strategy='gaussian')
        )
} else {
        resP = NULL
}

## Loading required namespace:  INLA
```

LGCP with table priors

```
sdSeq = seq(0,4,len=501)
rangeSeq = seq(0,15*1000, len=501)
if(requireNamespace("rgdal") & requireNamespace("rgeos") & requireNamespace("INLA")) {
        resT=lgcp(formulaHere,
                    data=murderT,
                    grid=squareRaster(borderC, 30),
                    covariates=covList,
                    border=borderC, buffer=2000,
```

```
                            prior = list(
                                           sd = cbind(sdSeq, dexp(sdSeq, 2)),
                                           range = cbind(rangeSeq, dexp(rangeSeq, 1/5000)))
                            control.inla = list(strategy='gaussian')
        )
} else {
        resT = NULL
}

## Loading required namespace:  INLA
```

Parameters

```
if(!is.null(resG$parameters))
        knitr::kable(resG$parameters$summary[,c(1,3,5)], digits=3)
```

```
if(!is.null(resP$parameters))
        knitr::kable(resP$parameters$summary[,c(1,3,5)], digits=3)
```

```
if(!is.null(resT$parameters))
        knitr::kable(resT$parameters$summary[,c(1,3,5)], digits=3)
```
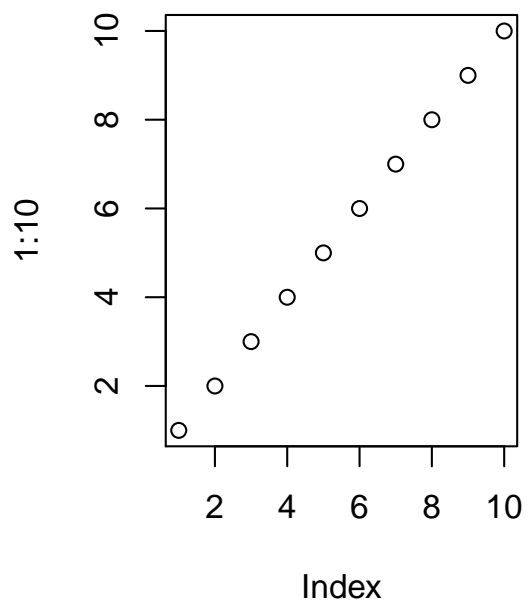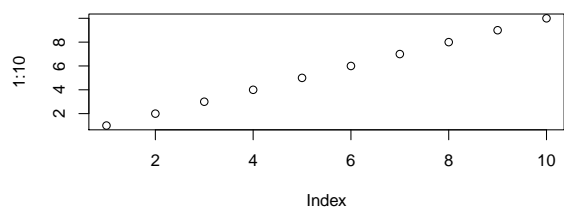
Maps

Figure 1: Priors and posteriors

Figure 2: Random effects and fitted values