

LGCP with PC priors

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

```
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=torontoPdents,
  inc = log(torontoIncome) )

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

LGCP with gamma priors on precision

```
if(requireNamespace("rgdal") & requireNamespace("rgeos") & requireNamespace("INLA")) {
  resG=lgcp(formulaHere, data=murderT,
    grid=squareRaster(borderC, 30),
    covariates=covList,
    border=borderC, buffer=2000,
    priorCI = list(sd = c(0.05, 0.5), range = c(1, 10)*1000),
    control.inla=list(verbose=TRUE)
  )
}
```

```

} 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,
            priorCI = list(sd = c(u=0.5, alpha=0.05), range = c(1, 10)*1000)
  ) } 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,
            priorCI = list(
              sd = cbind(sdSeq, dexp(sdSeq, 2)),
              range = cbind(rangeSeq, dexp(rangeSeq, 1/5000))
            )
  )} else {
  resT = NULL
}

```

```
## Loading required namespace: INLA
```

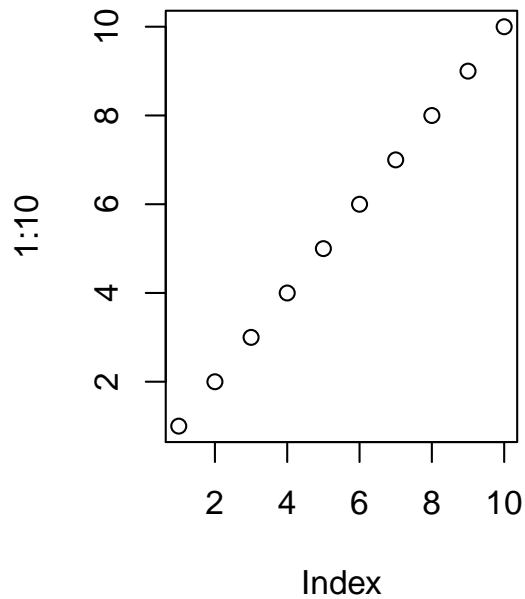


Figure 1: Priors and posteriors

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

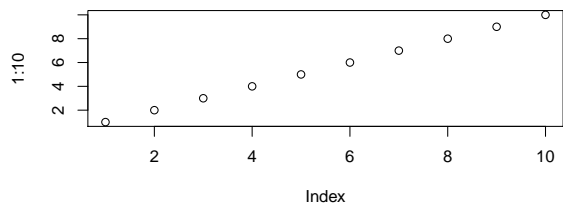


Figure 2: Random effects and fitted values