

The commands for the example in Diggle, Ribeiro Jr and Christensen (2002) [*bookchapter*], and Christensen and Ribeiro Jr (2002) [*R-news*].

WARNING: RUNNING THIS IS VERY TIME-CONSUMING AND MEMORY-DEMANDING

```
## Simulating data
sim <- grf(grid = expand.grid(x = seq(0.0555, 0.944444, l = 8), y = seq(0.0555, 0.944444, l = 8)),
cov.pars = c(0.5, 0.2))
attr(sim,"class") <- "geodata"
sim$units.m <- rep(4,64)
sim$prob <- exp(sim$data)/(1+exp(sim$data))
sim$data <- rbinom(64, size = sim$units.m, prob = sim$prob)

## Visualising the data and the (unobserved) random effects
par(mfrow = c(1,2), mar=c(2.3,2.5,.5,.7), mgp=c(1.5,.6,0), cex=0.6)
plot(c(0, 1), c(-0.1, 1), type="n", xlab="Coordinate X", ylab="Coordinate Y")
text(sim$coords[,1], sim$coords[,2], format(round(sim$prob,digits=2)),cex=0.9)
plot(c(0, 1), c(-0.1, 1), type="n", xlab="Coordinate X", ylab="Coordinate Y")
text(sim$coords[,1], sim$coords[,2], format(sim$data),cex=1.1)
points(sim$coords[c(1,29),],cex=5.5)

## Setting input options and running the function
prior.sim <- prior.glm.control(beta.prior = "normal", beta = 0, beta.var = 1, phi.prior = "exponential",
phi = 0.2,
  phi.discrete = seq(0.005,0.3, l=60), sigmasq.prior = "sc.inv.chisq", df.sigmasq = 5, sigmasq = 0.5)
mcmc.sim <- mcmc.control(S.scale = 0.05, phi.scale = 0.015, thin = 100, burn.in = 10000)
pred.grid <- expand.grid(x = seq(0.0125, 0.9875, l = 40), y = seq(0.0125, 0.9875, l = 40))
out.sim <- output.glm.control(sim.predict = TRUE)
run.sim <- binom.krige.bayes(sim, locations = pred.grid, prior = prior.sim, mcmc.input = mcmc.sim,
output=out.sim)

## Autocorrelations
require(ts)
par(mfrow=c(3,2), mar=c(2.3,2.5,.5,.7), mgp=c(1.5,.6,0), cex=0.6)
plot(run.sim$posterior$sim[1,],type="l", ylab = "S(0.056, 0.056)")
acf(run.sim$posterior$sim[1,], main = "")
plot(run.sim$posterior$sim[29,],type="l", ylab = "S(0.563, 0.436)")
acf(run.sim$posterior$sim[29,], main = "")
plot(run.sim$posterior$phi.s,type="l", ylab = "phi")
acf(run.sim$posterior$phi.s, main = "")

## Plot of timeseries
par(mfrow=c(3,1), mar=c(2.3,2.5,.5,.7), mgp=c(1.5,.6,0), cex=0.6)
plot(run.sim$posterior$sim[1,],type="l", ylab = "S(0.056, 0.056)")
plot(run.sim$posterior$sim[29,],type="l", ylab = "S(0.563, 0.436)")
plot(run.sim$posterior$phi.s,type="l", ylab = "phi")

## Predictions
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```
sim.predict <- apply(run.sim$pred$sim,1,mean)
sim.predict.var <- apply(run.sim$pred$sim,1,var)
par(mfrow=c(1,2), mar=c(2.3,2.5,.5,.7), mgp=c(1.5,.6,0), cex=0.6)
image.kriging(x= sim.predict, locations = pred.grid, values = sim.predict, col=gray(seq(1,0,l=30)),
  x.leg=c(0.1,0.9), y.leg = c(-0.12,-0.07), cex.leg=0.7, xlab="Coordinate X", ylab="Coordinate Y")
image.kriging(x= sim.predict.var, locations = pred.grid, values = sim.predict.var,
  col=gray(seq(1,0,l=30)),
  x.leg=c(0.1,0.9), y.leg = c(-0.12,-0.07), cex.leg=0.7, xlab="Coordinate X", ylab="Coordinate Y")
```