

```
library(tidyverse)
library(spatstat)
library(ggmap)
library(rstudioapi)
tinytex::install_tinytex()
```

```
data <- read_csv("./Potholes_Patched.csv")
Xcoord = as.ppp(as.matrix(data[,c("LONGITUDE", "LATITUDE")]),
               c(min(data$LONGITUDE), max(data$LONGITUDE),
                 min(data$LATITUDE), max(data$LATITUDE))))
```

100 times

```
Kfun <- envelope(Xcoord, fun = Kest, nsim = 100, verbose = F)
plot(Kfun)
```

has google key, registered google maps api but for some reason google maps api doesn't work properly?

```
has_google_key()
pothole_map <- get_map("Indianapolis, IN")
```

Kernel density heat map

```
p = ggmap(pothole_map)+stat_density2d(data=data,
                                     aes(x = LONGTITUDE, y = LATITUDE,
                                           fill = ..level.., alpha=..level..),
                                     bins = 20, h=.025,
                                     geom = "polygon")+
  scale_fill_gradientn(colours=c("yellow", "orange", "red"))+
  guides(fill="none", alpha="none")
```