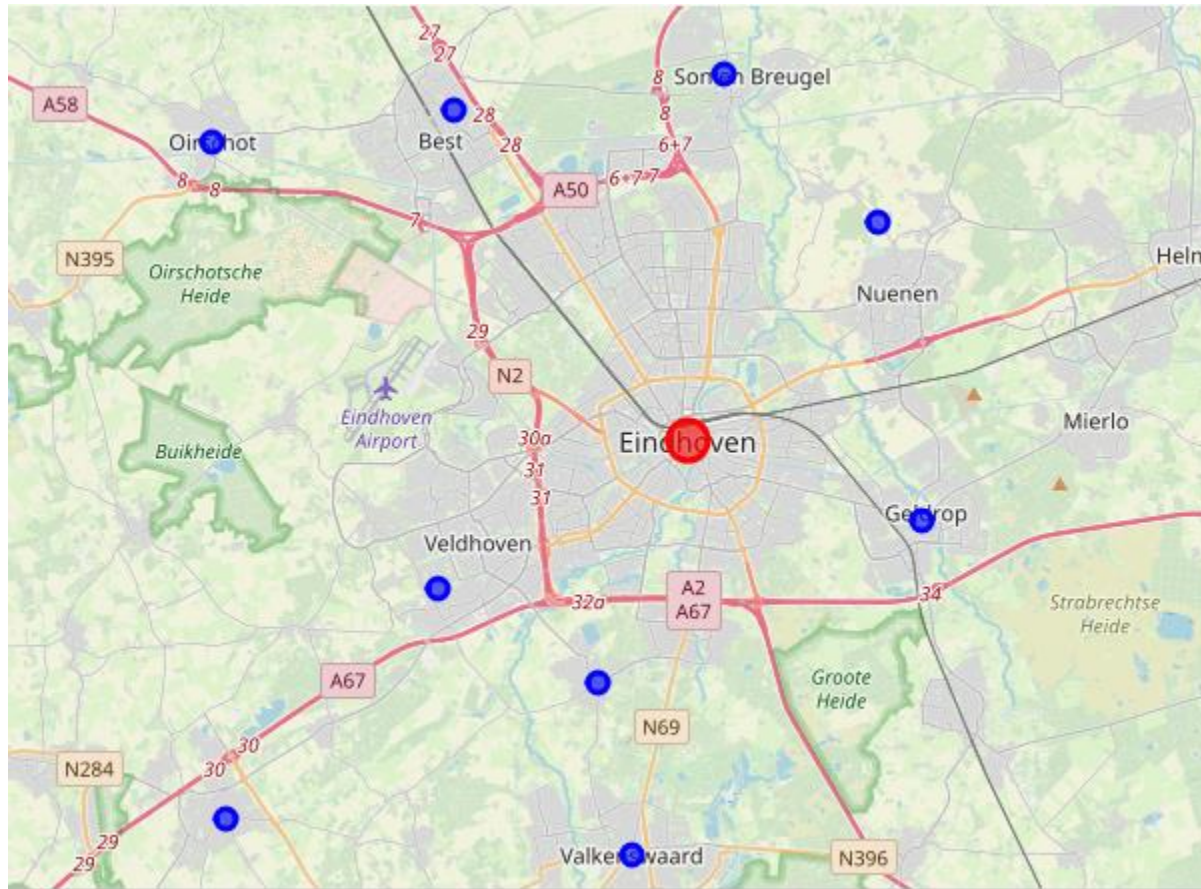# Criminality Analysis in and around Eindhoven based on Nightclub density

Vincent Rikkink

Summary

- **Abstract:** Analyze criminality and see whether there is a correlation with Nightclub density
- **Business case**: Results might give more insight in how to improve security
- **Data Sets:**
  - Total number of citizens per community (CBS database)
  - Crime numbers per community (CBS database)
  - Extract the number of nightclubs in the center of the community (FourSquare)
- **Visualization**
- **Conclusions**

Eindhoven and its Neighbourhoods

Data sets

Data about crimes and population are obtained from CBS.nl

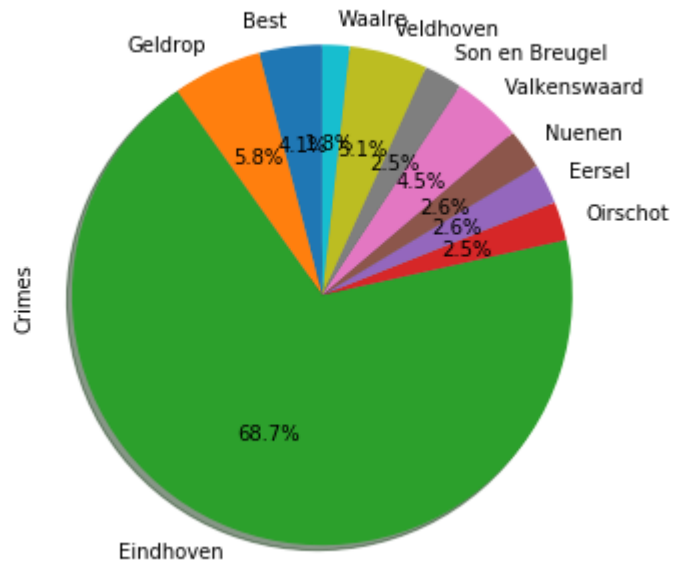| place	lat	lng	Crimes	Citizens
Best	51.510017	5.398662	1100	29497
Geldrop	51.422199	5.559182	1565	39252
Eindhoven	51.439265	5.478633	18600	229126
Oirschot	51.503239	5.315549	675	18558
Eersel	51.358637	5.320131	700	18778
Nuenen	51.486030	5.544007	705	23019
Valkenswaard	51.350688	5.459450	1220	30654
Son en Breugel	51.517813	5.491435	665	16753
Veldhoven	51.407706	5.392731	1370	44925
Waalre	51.387640	5.447687	475	17075

Extended data set

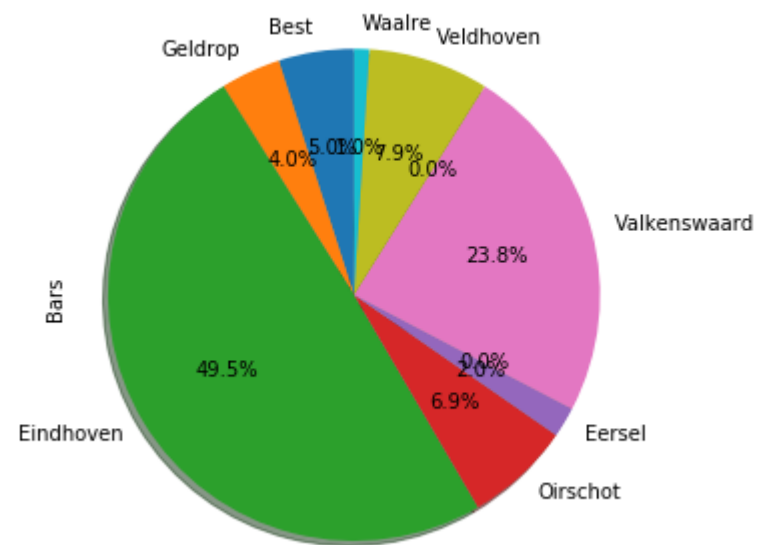Data about the number of nightclubs is obtained from FourSquare searches.

place	lat	lng	Crimes	Citizens	RelCrime	Radius	Bars
Best	51.510017	5.398662	1100	29497	37	515	5
Geldrop	51.422199	5.559182	1565	39252	39	594	4
Eindhoven	51.439265	5.478633	18600	229126	81	1436	50
Oirschot	51.503239	5.315549	675	18558	36	408	7
Eersel	51.358637	5.320131	700	18778	37	411	2
Nuenen	51.486030	5.544007	705	23019	30	455	0
Valkenswaard	51.350688	5.459450	1220	30654	39	525	24
Son en Breugel	51.517813	5.491435	665	16753	39	388	0
Veldhoven	51.407706	5.392731	1370	44925	30	635	8
Waalre	51.387640	5.447687	475	17075	27	392	1

Crime & Nightclub pie charts

Crime distribution in Eindhoven and Neighbourhoods
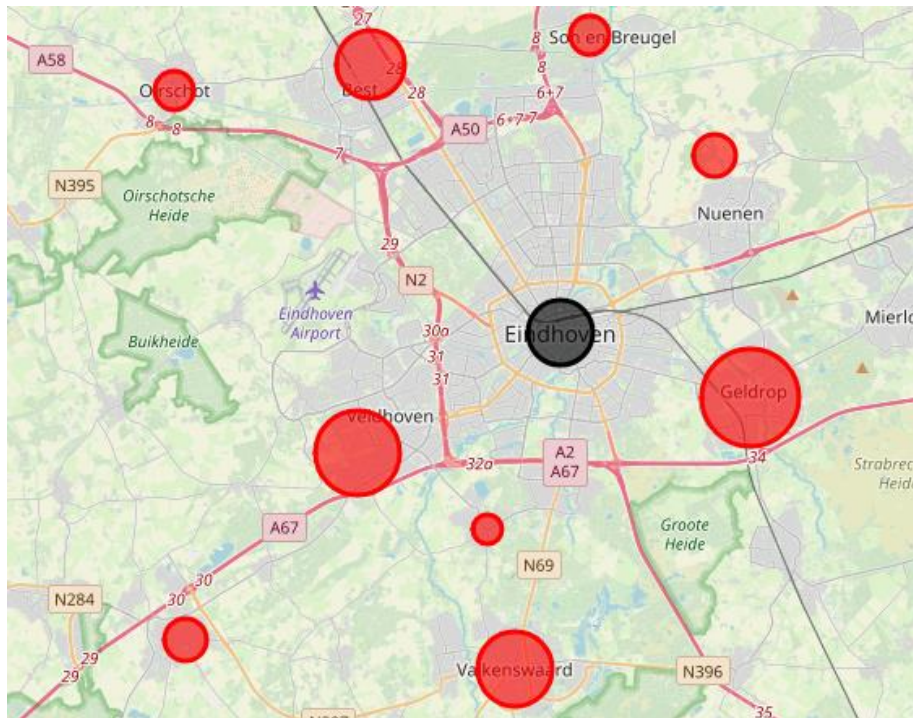
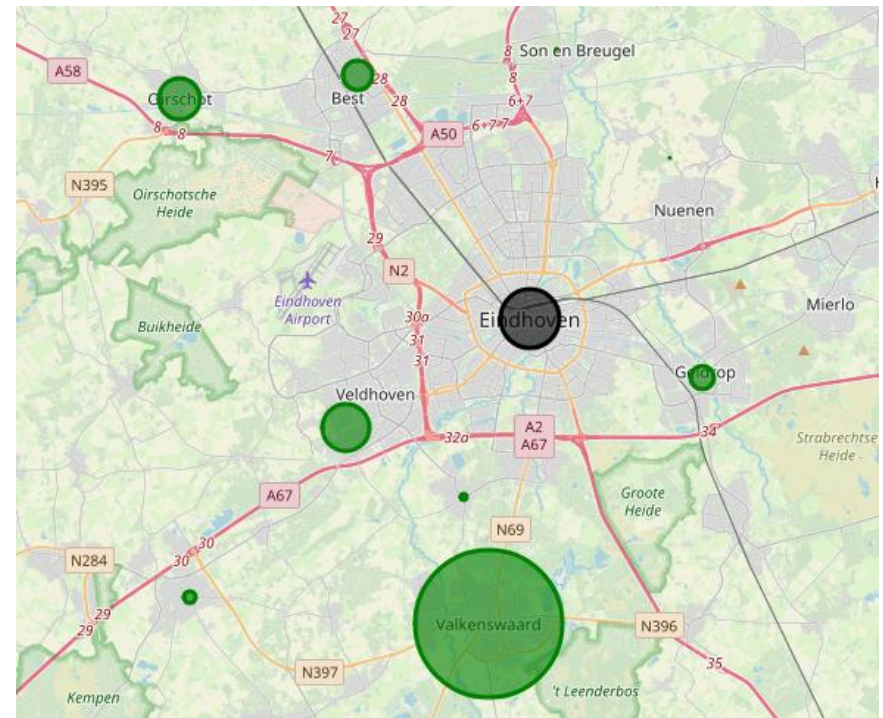Nightclub distribution in Eindhoven and Neighbourhoods

Crime & Nightclub spatial distribution

Crime density in
Eindhoven
Neighbourhoods

Nightclub density in
Eindhoven
Neighbourhoods

Correlation Results

	Crimes	Bars	Citizens
Crimes	1.000000	0.905218	0.995706
Bars	0.905218	1.000000	0.909013
Citizens	0.995706	0.909013	1.000000

- Very high correlation between #Citizens & #Crimes

- Also a high correlation between #Bars & #Crimes

Conclusion

- **Population and crimes are more strongly correlated than nightclubs and crimes**

- **From the spatial data some interesting conclusions can be drawn:**
  - **More nightclubs on the west side of Eindhoven.**
  - **Slightly more crimes registered on the south side of Eindhoven**