# Predictive Policing with Human Mobility Data

Marta González[1,2,3,4] and Phil Chodrow[1,2]

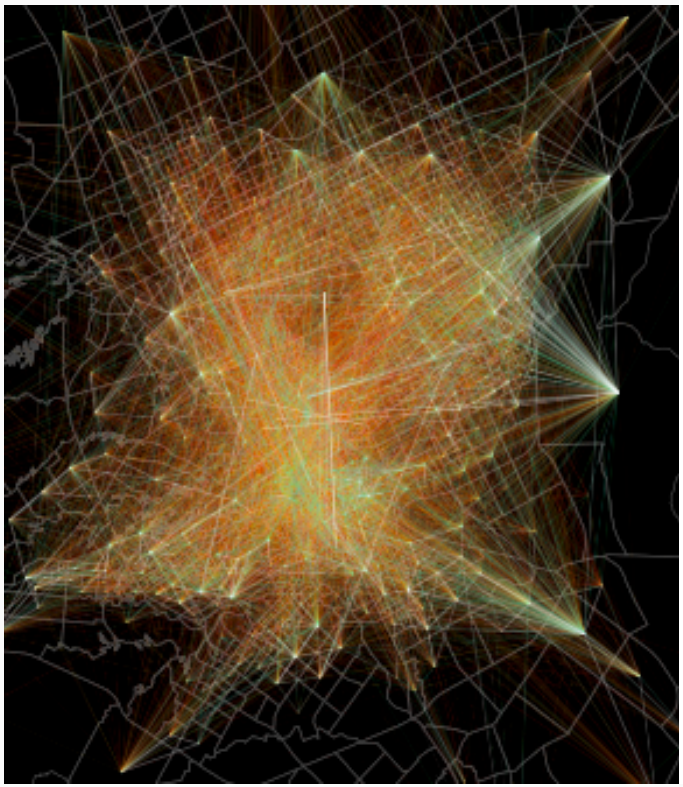
August 6, 2016

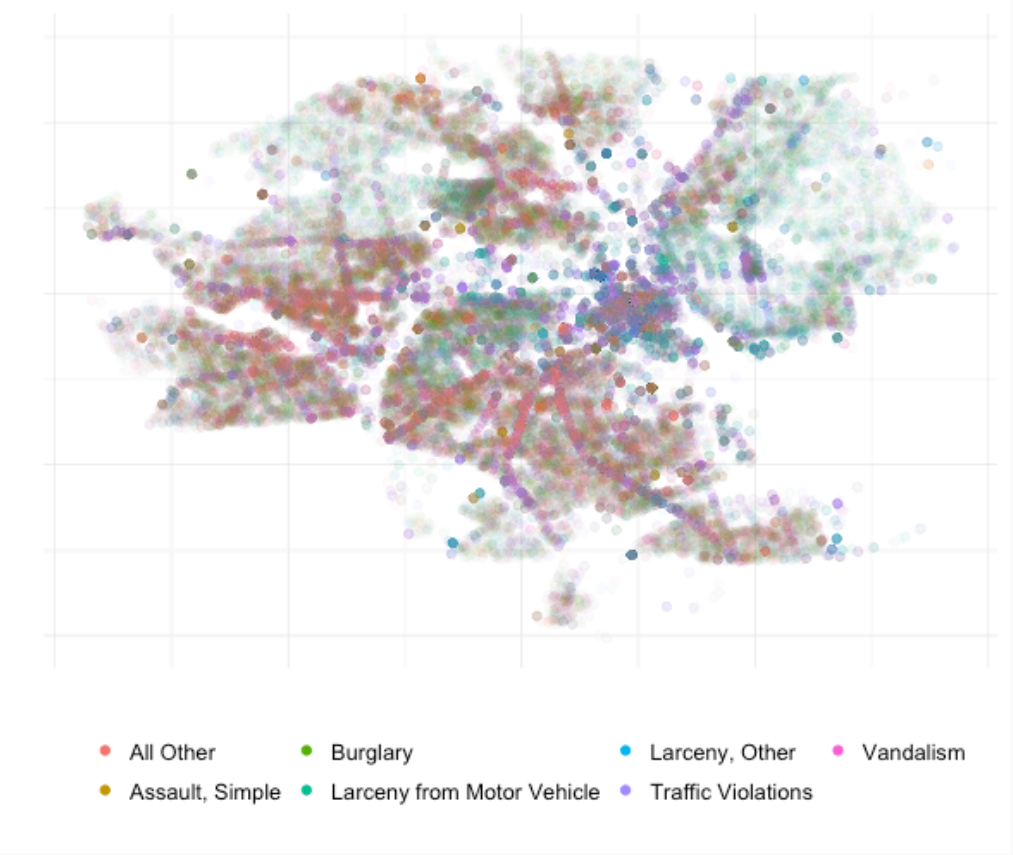
[1]MIT Human Mobility and Networks Laboratory
[2]MIT Department of Civil and Environmental Engineering
[3]MIT Center for Advanced Urbanism
[4]MIT Operations Research Center

# The Opportunity

Use human behavioral and demographic data to predict crime hotspots and guide deployment of policing resources.

We'll be using publicly available data sets and open source tools.





# Work to Build On

[1] found that behavioral data can predict crime hotspots.

Expansion directions:

1. More specific predictions
2. Spatially aware analysis
3. Interpretable models

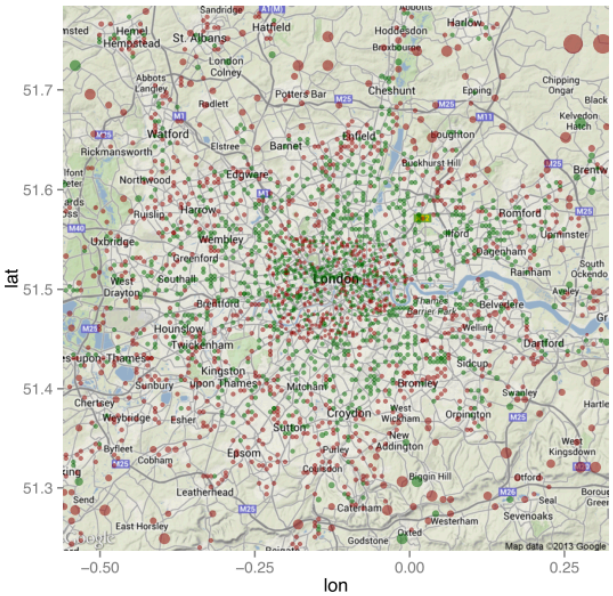



**Figure 2:** *Ground Truth of Crime Hotspots*

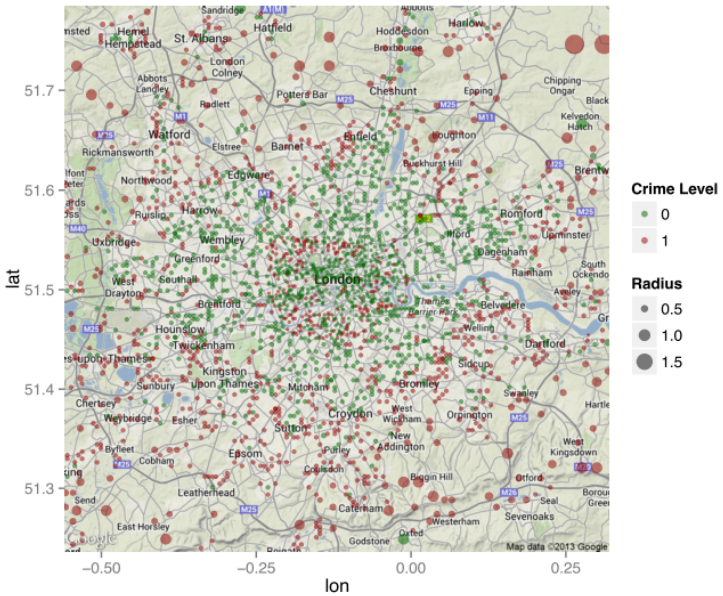



**Figure 3:** *Predicted Crime Hotspots*

# Your Resources

**Data:**

1. Mobility: Providence CTPP commuting flows
2. Crime: Almost 200K incident reports in PVD
3. Demographics: from the U.S. Census (we can help you access)

**People:** us! Analysis of human behavior is our specialty, and we here to support you.

# Useful Skills

Experience is helpful, **lack of fear is required!**

1. An analytical programming language (e.g. Python, R, or Matlab).
2. Statistics, especially spatial statistics.
3. Network analysis, spatial analysis, and data visualization.

Thanks! We’re excited to work with you.

# References I


Andrey Bogomolov, Bruno Lepri, Jacopo Staiano, Nuria Oliver, Fabio Pianesi, and Alex Pentland.
**Once Upon a Crime : Towards Crime Prediction from Demographics and Mobile Data.**
*arXiv.org*, 2014.

CZ Marshak, MP Rombach, AL Bertozzi, and MR D'Orsogna.
**Growth and Containment of a Hierarchical Criminal Network.**
*arXiv*, 2016.

# References II

Nuria Oliver, Fabio Pianesi, Alex Pentland, Andrey Bogomolov, Bruno Lepri, Jacopo Staiano, and Emmanuel Letouze.
**Moves on the Street : Classifying Crime Hotspots Using Aggregated Anonymized Data on People Dynamics.**
*Big Data*, 3(3):148–158, 2015.

Martin B Short, P Jeffrey Brantingham, Andrea L Bertozzi, and George E Tita.
**Dissipation and displacement of hotspots in reaction-diffusion models of crime.**
*PNAS*, 107(9):3961–3965, 2010.

# References III

Jameson L Toole, Nathan Eagle, and Joshua B Plotkin.
**Spatiotemporal Correlations in Criminal Offense Records.**
*ACM Transactions on Intelligent Systems and Technology*, 2(4), 2011.