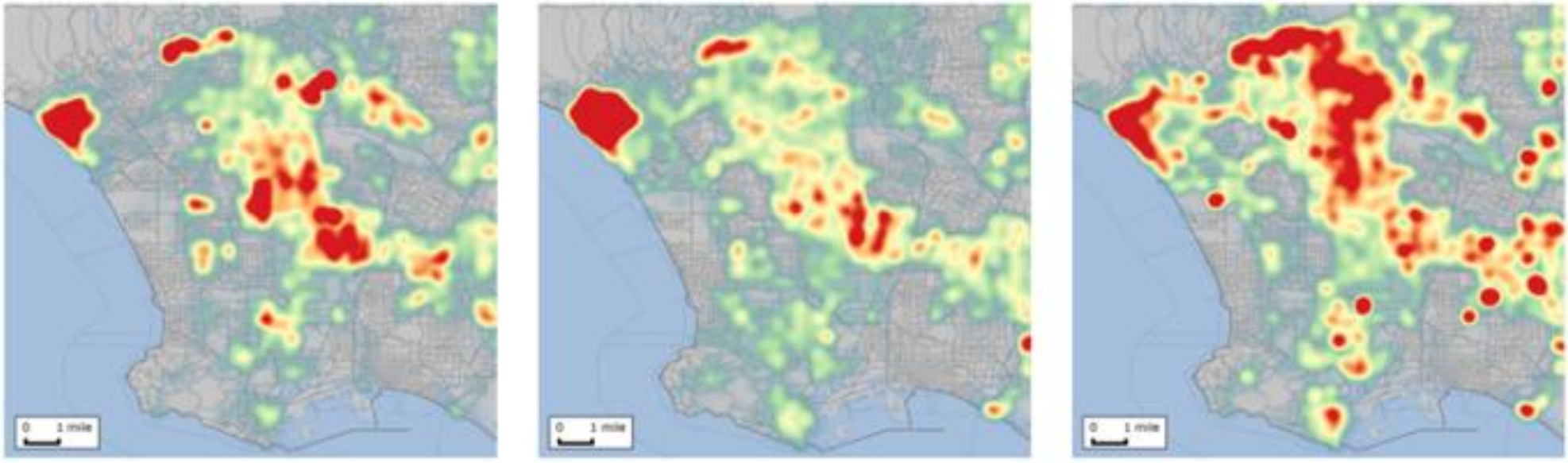
Inspiring Science: CEMPS Inaugural Lectures



On the Scale, Concentration and Dynamics of Crime

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Wednesday 15th May 2019, 6pm

Harrison Lecture Theatre, 004

Refreshments will be available from 5.30pm

Crime is a major risk to society's well-being, particularly in cities, and yet the scientific literature lacks a comprehensive statistical characterization of crime that could uncover some of the mechanisms behind such pervasive social phenomenon. Evidence of nonlinear scaling of urban indicators in cities, such as wages and serious crime, has motivated the understanding of cities as complex systems—a perspective that offers insights into resources limits and sustainability, but usually without examining the details of indicators. Notably, since the nineteenth century, criminal activities have been known not to occur uniformly within a city. Crime concentrates in such way that most of the offenses take place in few regions of the city. However, though this concentration is confirmed by different studies, the absence of broad examinations of the characteristics of crime concentration hinders not only the comprehension of crime dynamics but also the proposal of sounding counter-measures. Here, we developed a framework to characterize crime concentration which splits cities into regions with the same population size. We used disaggregated criminal data from 25 locations in the U.S. and the U.K. which include offenses in places spanning from 2 to 15 years of data. Our results confirmed that crime concentrates regardless of city and revealed that the level of concentration does not scale with city size. We found that distribution of crime in a city can be approximated by a power-law distribution with exponent α that depends on the type of crime. In particular, our results showed that thefts tend to concentrate more than robberies, and robberies more than burglaries. Though criminal activities present regularities of concentration, we found that criminal ranks have the tendency to change continuously over time. Such features support the perspective of crime as a complex system which demands analyses and evolving urban policies covering the city as a whole.