Roberto Murcio - Dissertation Topics 2020/21

1. Pedestrians flows in retail areas

Joining footfall data with retail and transport information, could help building a detail picture of the micro spatial and temporal dynamics in our streets. Using Machine Learning, you could, for example:

* Forecast the amount of people at certain location at certain times
* Inform local authorities of potential overcrowding problems
* Provide a novel retail area classification, based on temporal pedestrian flows
* Detect micro spatial-temporal movements patterns.
* Help particular retailers planning ahead their open/close schedules

Data:

<https://data.cdrc.ac.uk/dataset/local-data-company-smartstreetsensor-footfall-data-%E2%80%93-aggregated-data>

From CDRC - SmartStreetSensor Footfall Data – Aggregated data (This is Safeguarded – You need to apply for it but the process is straightforward) and the Retail Centre Definitions

From Geolytix -Retail points open data

For London – Tube stations data (locations, aggregated flows) from TFL open data.

1. Urban Analytics and Transport Inequality

Existing evidence highlights the complexity of the links between transport and inequality. There are several dimensions by which accessibility of transport can be measured, such as modes and cost of transportation, distance to public transport and length of journeys to work, school and necessary services.

There are many directions you could take here:

* Link socio-economic data (multiple deprivation, small area incomes, household poverty estimates) with accessibility indexes (Healthy Assets and Hazards index for example) and transport data (trips and travel costs by MSOA) and produce a novel area classification at Middle-Super Output Areas in England/Wales for example.
* Use the Index of Access to Healthy Assets and Hazards (AHAH) and link it with OD matrices and transport cost and propose a new transport inequality measure and propose new scenarios that could reduce such inequality (using a spatial interaction model for example)
* Based on the previous point, you could train a Machine Learning algorithm to detect the optimal configuration of an *OD-transport cost-access index* scenario from scenario space.

Data 1) Working population, Employment [1]; 2) Socioeconomic inequality measures, AHAH [2];

[1] Census - Table WU03UK

[2] CDRC data.cdrc.ac.uk/dataset/english-indices-of-deprivation-2010-and- 2015-data-pack ; <https://data.cdrc.ac.uk/dataset/index-multiple-deprivation-imd> ; https://data.cdrc.ac.uk/dataset/ahah2