**How to combine trajectory data with social encounter profile and reveal about infection**

1. Background

Mobility data describes the mobility behaviour of people in a particular area, such as the journey-to-work data in a country. If we can accurately find the relationship between the outbreak trend of infectious diseases and mobility data through the establishment of models, then we can take certain measures to prevent the outbreak. Much Research has been done to identify the model of the spread of infections based on mobility data at either national and international or individual buildings such as school or hospitals.

Moss et al focus on the infection at metropolitan scale. However, how to gain appropriate mobility data increasingly becomes a difficult and important topic. Many technologies have been used to mining this kind of data. Zheng et al. developed a complete process to mining and process trajectory data of human or animals.

But there are still two kinds of challenges: 1. Collecting data; 2. Analyzing data. About collecting data, some important data is hard to collect, such as those characterise private features. When it comes to analyze the data, basicly, even just applying corresponding method to a particular data set is a big challenge, and combining mobility data and social encounters of respondents is necessary, because some behaviors may have effect on infection. Moreover, Roll et al. analyze social encounter of some respondents, and give results based on age, gender and so on.

1. Outline the question

This research will focus on using existing methodologies and algorithms to mine new trajectory dataset at urban scale that consider the factors that may affect the chance of infecting, such as the length for a person staying at one place and so on. Also, based on what Roll et al have discovered, this research will identify the technologies that can combine social encounter data and mobility data, and use it to reveal about the pattern or predict the trend of infection.

1. The step to solve the problem

Firstly, during this semester, I will read literature involves methodologies which is used to mining trajectory data, get familiar with math concepts, technologies and algorithms used in this step (e.g. mean filter). Moreover, some technologies need to be applied to the dataset to gain more useful information. I’ll read many papers to learn or identify this kind of technologies. Also, the knowledge of build model based on dataset is needed, I’ll read some paper and roughly know the whole process of building and analyzing model. In a word, some preparation for the research can be done.

Then, for the next semester, I’ll try to identify a particular mobility dataset, and combine social encounter profile with it. About the last semester, I’ll apply corresponding technologies to the dataset gained in the second semester, and get some useful information.

**Reference**

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