

Poster Abstract: The CORONA Business in Modern Cities

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ABSTRACT

As a response to the global outbreak of the SARS-COVID-19 pandemic, authorities have enforced a number of measures including social distancing, travel restrictions that lead to the “temporary” closure of activities stemming from public services, schools, industry to local businesses. In this poster we draw the attention to the impact of such measures on urban environments and activities. For this, we use crowdsensed information available from datasets like Google Popular Times and Apple Maps to shed light on the changes undergone during the outbreak and the recovery.

CCS CONCEPTS

• Information systems → Crowdsourcing; • Applied computing → Health care information systems.

KEYWORDS

SARS-COVID-19, crowdsensing, data collection, urban computing

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1 INTRODUCTION

The global outbreak of the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV-2) uncovered the unpreparedness of the vast majority of healthcare systems [1] and lead worldwide public institutions to enforce containing measures such as *social distancing*, *cancellation of public events* and *closure* of daily business, education and recreation activities. As a consequence, business and education systems moved to *remote* working and teaching, which led to unprecedented changes in the way of consuming Internet services. A recent study [3], demonstrates that the traffic generated by applications such as gaming, messaging, Web conferencing witnessed a significant increase. Reducing and controlling human movement has been of the utmost importance in containing the pandemic spread and to track infections. To this end, many applications have been developed to enforce contact tracing systems (e.g., Corona-Warn-App, Immuni and Radar COVID are examples respectively adopted by Germany [5], Italy and Spain) [4].

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In this work, we present the ongoing research efforts devoted to analyze the implications of confinement policies and self-isolation measures on urban environments. Specifically, we draw the attention to the impact that the changes of our daily habits produced on urban mobility and activities. The utility of such analysis is twofold. On the one hand, we can verify the effectiveness of confinement policies to limit the spread of the virus, i.e., the increase/decrease of the number of infected cases upon relaxation/enforcement of such policies respectively. On the other hand, we can determine which are the changes to urban mobility and daily activities. This information is very important for the concerned stakeholders, e.g., governments bodies, decision-makers and city planners to re-think the existing urban landscape and drive more sustainable city planning. For such analysis, we use crowdsensed data that providers such as Google and Apple make available [2]. Next, we present the dataset (§ 2) and the methodology with early results (§ 3).

2 THE DATASET

We present the types of data we use in our analysis, i.e., mobility, activities and publicly available data on SARS-COVID-19 cases.

Google Popular Times (GPT) define the temporal profile of an activity (recreational, groceries, transit and stations and parks) as a vector of normalized per-hour weekly values in the range [0 : 100] (0: closing hours, 1: lowest amount of visits per-hour in a week and 100: the highest). The use of normalized values shows the trend of an activity during a week and inherently the factors that influence such behaviour (e.g., a restaurant that has more success during weekends in touristic areas or at lunchtime in business districts). This hides the degree of success of a single activity (i.e., those that have more customers than others). However, in this work we are not interested in the *absolute* number of visits, but only the trend over time. Fig. 1 shows the geographical distribution of the considered cities and Table 1 shows the breakdown of the number of vantage point per activity category. Although we started the data collection on March 8th 2020, we have consistent information for all the cities since April 23rd only.

Table 1: A primer on our dataset for a selection of cities with the number of vantage points available per activity

CITY	RECREATIONAL	GROCERIES	TRANSIT STATIONS	PARKS
London	–	38	68	30
Madrid	30	8	15	–
Milan	21	7	21	1
Stockholm	13	8	10	1
Copenhagen	–	50	6	7
Valencia	8	10	9	1
Malmö	7	24	3	5
Luxembourg City	10	54	9	1

Apple Maps dataset provides information on transportation modalities worldwide in a similar way that GPT does, i.e., data is anonymized and no information about the single users is disclosed. Rather,

