Visualisation of pedestrian activity in the city of Melbourne

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1 Introduction

In a world where sustainable development assumes an ever more pertinent position in the global imaginary, walking, travel by foot, has become revered as a viable alternative to the use of automobiles. More than a mere mode of transport, walking has revealed itself to be a veritable vector of life and major contributor to urban dynamism; for the past 10 years pedestrians have been implicated at the very heart of urban practices[1]. It is therefore logical to ascertain that numerous issues linked to urbanism and security in relation to the pedestrian body have appeared. In order to respond to this issue, it seems first crucial to study the behavior of pedestrians at the heart of the urban landscape[3].

With the aim to better understand pedestrian activity, the city of Melbourne has put into place an automatic system designed to count and record pedestrian numbers. In order to achieve this, pedestrian counting devices have been placed at certain populous locations within the city. The number of counting devices present in the city has risen from 18 in May 2009 to 44 at present. These pedestrian counting devices collect information which permits the temporal and spatial examination of pedestrian habits. The information collected is used by the city notably in the imposition of certain commercial strategies as well as in urban planning. We intend to utilize this data in order to create a visualization of pedestrian activity in Melbourne. In order to create such a visualization, we equally intend to use meteorological data as well as data pertaining to events occuring at specific locations, in order to explicate the correlation between the number of citizens at each location and the external factors influencing their presence there.

The final visualization must therefore provide a clear and adequate representation of the data studied; we thus intend to investigate different means through which to present the data. Our project will investigate numerous visual tools including maps, which will be further explicated with advanced and personal ocular techniques in order to obtain an efficient and demonstrative visualization of the data studied.

2 Inspiration

The city of Melbourne offers to visualize the data that we study in free access, a map visualization realized by **OOMCreative** (*figure 1*) is indeed available. It presents a global visualization of pedestrian activity by describing hour by hour the number of individuals detected at the locations where the sensors are placed. It also compares the current inflow with an average of the inflows collected on the same day at the same time. Thus the visualisation gives a detailed graphical representation of the information collected in relation to historical trends (*figure 2*).

It is this work that will serve as a basis for our project. Simple to manipulate and understand, this visualization only provides a simple approach to describing data. Our job will be to flesh out this work, to make it more comprehensive, highlighting other statistics. We will also consider external factors, such as weather or the holding of events in certain parts of the city and at a specific time, that will explain the values of some of our data. Our visualization should therefore be able to represent and reveal the possible correlations between this type of data and our initial dataset counting the number of people.

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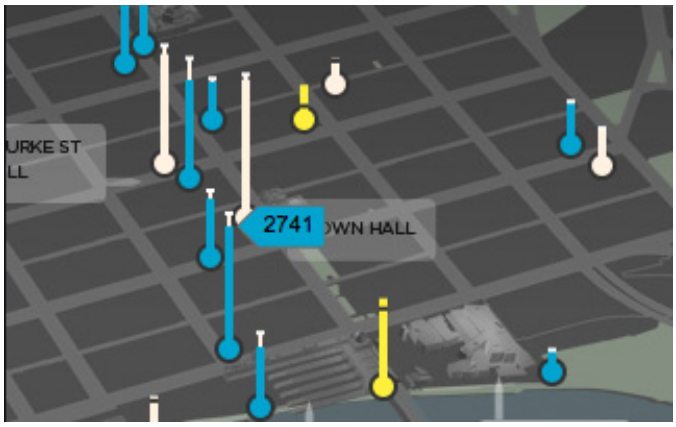

Fig. 1. Pedestrian activity visualisation in Melbourne by OOMCreation

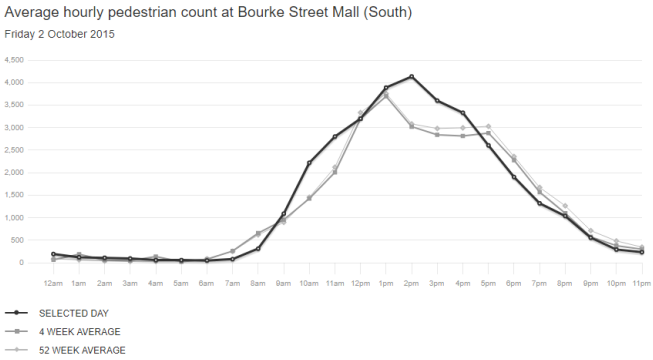

Fig. 2. Comparison of counts from a specific day to a 4 weeks average and a one year average

3 First ideas

3.1 Meteorological data

Data that could be used to embellish the initial model are meteorological data[2]. Pedestrians are totally exposed to the climate. Adding in the visualization the weather would allow to visualize well the consequences that the bad weather on the pedestrian activity.

In the same way that meteorological data can be represented on the Weather widget available on Android (*figure 3*), to visualize these meteorological data, we had the idea to represent them in the background of the visualisation map.

If aesthetically a visualization such as that it can be seen in figure 3 is reachable, the advantage would be that the rendering would not be overloaded, and would remain easily understandable.

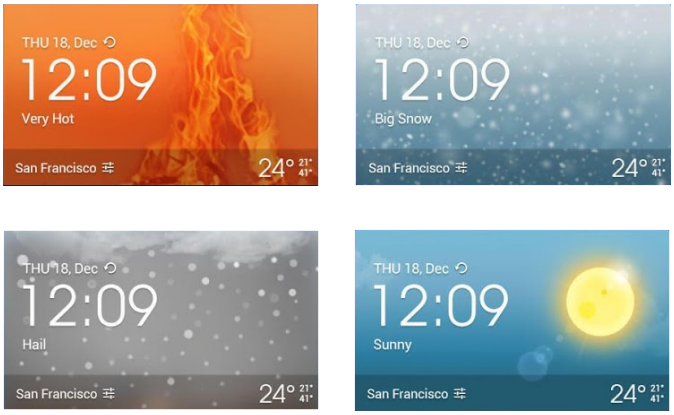

Fig. 3. Weather widget display image refering to weather in background

3.2 Map Visualisation

Although we are based on model aldready satisfacting, some points to improve visually remain. In particular the representation of the different counts for each sensor. Our idea is to represent them with circles, larger or smaller, depending on the number of pedestrians captured by the sensor. This would clearly visualize where pedestrians are most present.

Also, in our visualization sketch we decided to present the comparison data with the averages over several days in a block apart so as not to overload our map. In the same way an overview of the general statistics of our data will be presented in a block under our map visualization. This block will also allow us to focus on more targeted statistics such as pedestrian accounts by date (time, day, month), or to view accurate data per sensor. (*voir figure 4*)

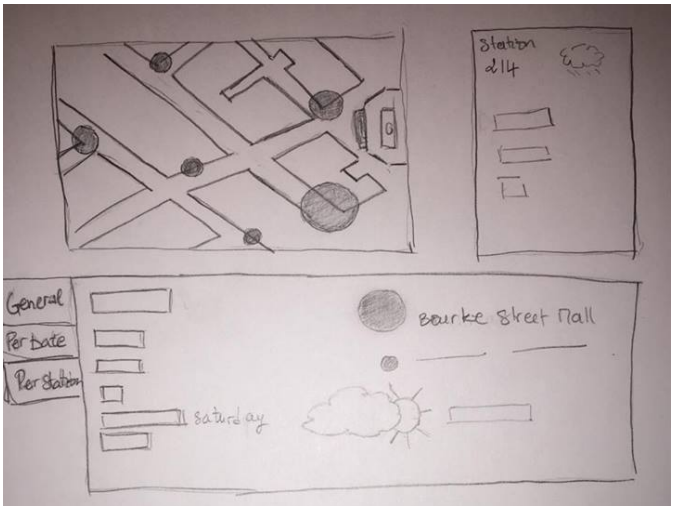

Fig. 4. Sketch of our final visualization describing pedestrian activity

4 For further

Close to the idea of the weather but perhaps more interesting to study, we also want to describe a model (at least extract an example) of a correlation between pedestrian traffic and the holding of a large manifestation around.

Example. Pedestrian count around a stadium before and after a sport event

5 Conclusion

An overall idea of what our final visualization will look like has been described in this article. Our work based on other existing ones that we will complement and improve by adding other data, in order to visualize relationships of influence between this data and the counts made by the sensors present throughout the city.

References

[1] Melbourne pedestrian couting. http://www.pedestrian.melbourne.vic.gov.au/datadownload.h
[2] Wunderground. https://www.wunderground.com/history/.
[3] C. Ferrier. Le pieton, la voiture et la ville. *Metropoliques*, Apr. 2013.