

Footfall at Kirkgate Market

Keiran Suchak, Nick Malleson, Jon Ward

Leeds Institute for Data Analytics, University of Leeds



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Introduction

In recent years, Leeds City Council (LCC) have undertaken measures to drive growth in footfall at Kirkgate market. The aims of this project were therefore:

1. Explore the factors that drive variations in footfall at Kirkgate market.
2. Estimate footfall at the market if it were open on Sundays.

These were achieved using two data sources from LCC: The first of these is a record of the counts of pedestrians passing through each of the market entrances over 2017; the second of these details the counts of pedestrians passing through different parts of the city centre.

1. Trends in Footfall

1.1 Variation across Sides of Kirkgate Market

The counts through the entrances of the market were aggregated based on which side of the market they reside — North, South, East or West. The sides can be split into two groups: the first group contains the west and east side entrances, and the second group contains the north and south side entrances. The former groups receive higher footfall counts throughout the year, whilst the latter groups receive lower footfall counts.

High footfall through the west side entrances is a consequence of this being the front of the market, facing Vicar Lane and the city centre; high footfall through the east side entrances is likely a consequence of people using them to either leave to or enter from the car park and bus station.

1.2 Variation with Events

The distribution of daily counts through the market entrances is somewhat bimodal, whether events are being held or not. The lower mode lies at approximately 24,000 counts and the upper mode lies around 32,000. The upper modal value of 32,000 occurs much more frequently when events are being held than when they are not (relative to the total number of days), indicating that events are drawing more customers as desired.

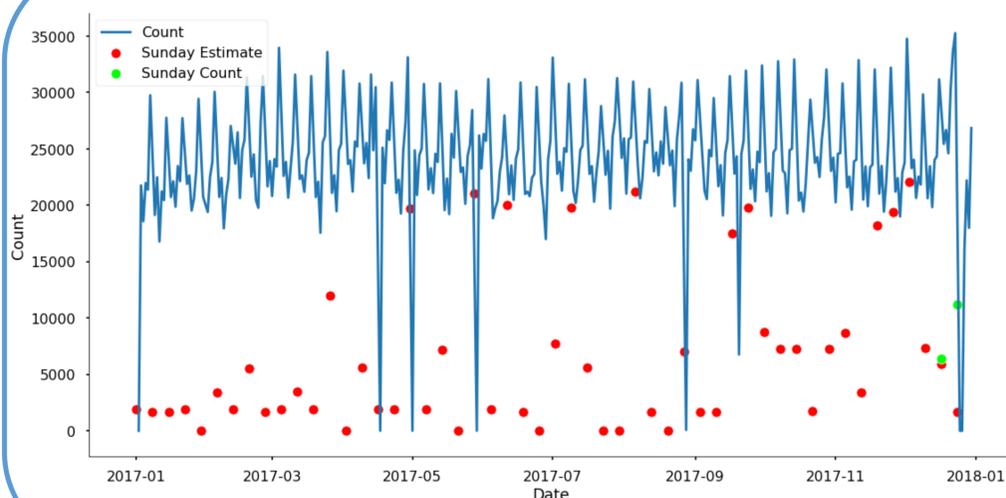


2. Estimating Activity on Sundays

A random forest model was trained to estimate the total daily counts at Kirkgate market based on the daily pedestrian counts produced by cameras in the city centre. The trained model was then used to produce estimates of total counts for the market on Sundays.

For the majority of weeks in the year, the estimated counts for Sundays are less than 25% of the values for the other days of the week. When comparing the estimates with the actual values for the last two Sundays of the year, many of the estimates for October, November and December are comparable.

It should be noted, however, that the model errors are significant — typically around 3,000.



Conclusion

This investigation has sought to achieve two goals. The first of these was an exploratory analysis of the data provided regarding weekly counts of pedestrians passing through the entrance of Kirkgate market, showing the differing levels of activity on different sides of the market, as well as the impact of events. The second goal was to estimate counts through the market entrances on Sundays. This was achieved using random forest model. The estimated values were typically less than 25% of those observed on other days of the week, although comparable to known Christmas values.



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Contact Details

Email: mm15ks@leeds.ac.uk

Website: <https://ksuchak1990.github.io/>

