A visual analytics approach to understanding cycling behaviour

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Research problem

Existing research into cycling behaviours has relied on detailed ethnographic studies or larger public attitude surveys[1]. The extent to which self-reported levels of cycling reflect actual behaviour is not well understood[1]. Bike share schemes offer new research possibilities[2,3].

Data set

Since its inception in Autumn 2010, more than 16 million bike journeys, between over 500 docking stations, have been made through the London bike share scheme. We have a record for each of these journeys, we can identify returning customers and we can augment the data set with numerous contextual data.

Technique

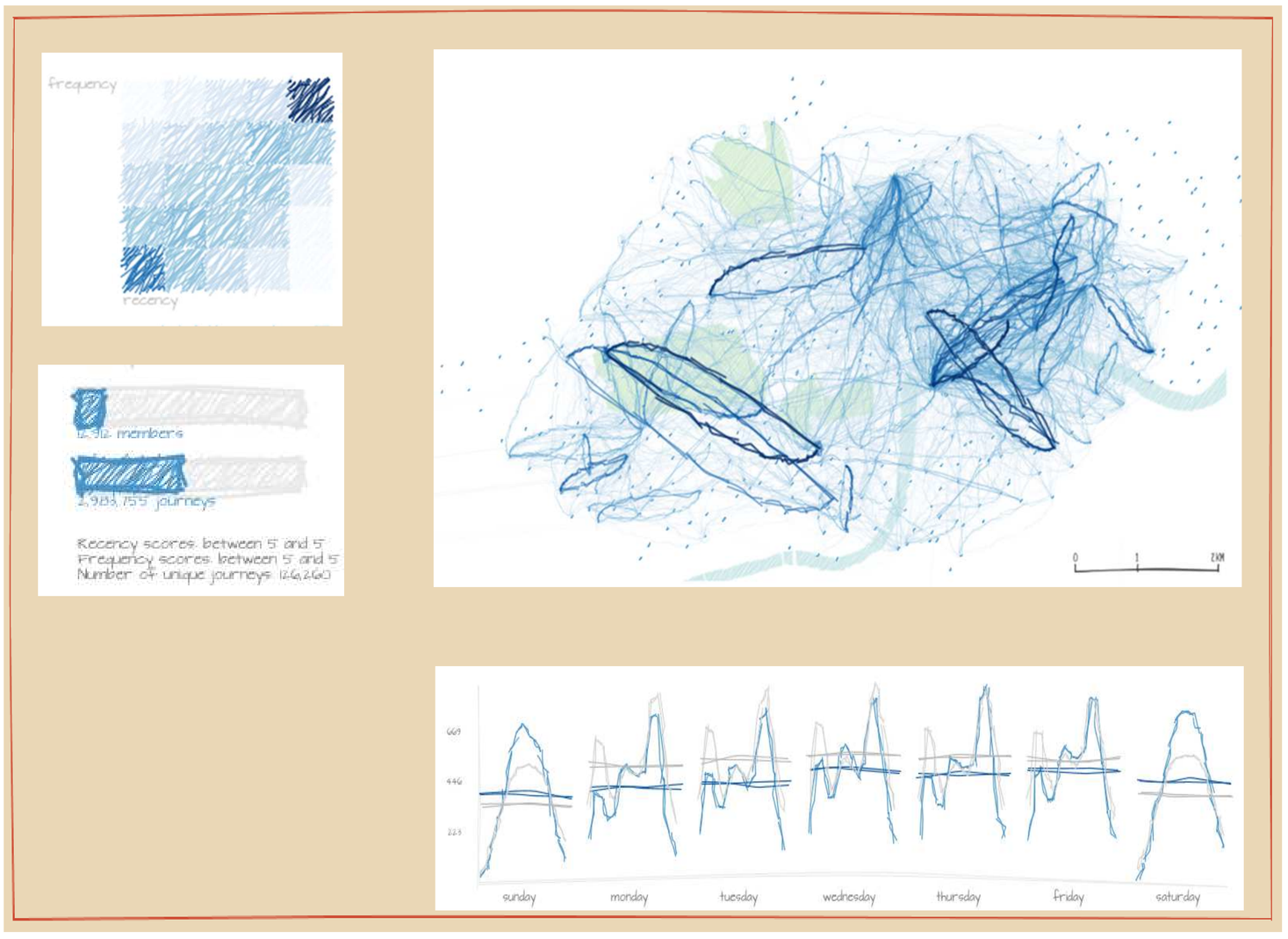
But as analysts, how can we understand the temporal structure and spatial expression of individual customer journeys? Moreover, how can we quickly explore the extent to which variables relating to journey context affect customer cycling behaviours?

Research ambition

Linking members with their journeys, we attempt to explore and explain cycling behaviours from an individual customer perspective.

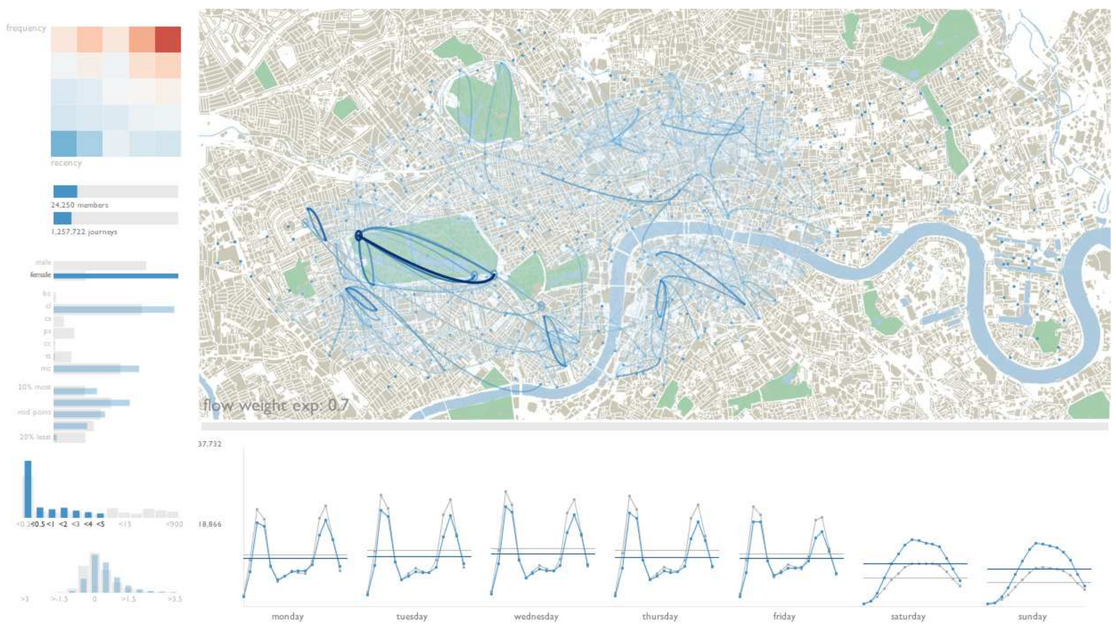
Design for early visual analytics prototype

We designed a visual analytics application to explore customer cycling behaviours. Three linked views enable space-time patterns of usage to be associated with customer-related segments.

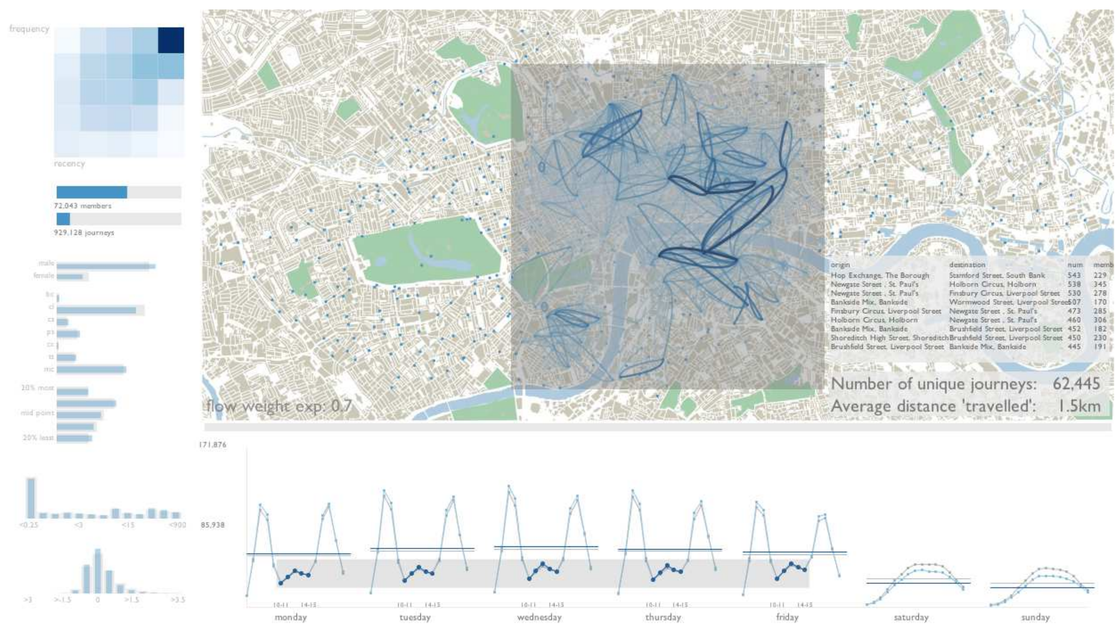


Analysis

Gendered cycling behaviours



Describing inter-peak travel



Future work

Future iterations of the application will support filtering by more formal customer and journey classifications. By attending to the context that frames particular behavioural groups, we hope to fully account for cycling behaviours.

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References

[1] C. Pooley *et al.* Understanding walking and cycling: a summary of key findings and recommendations. Technical report, *Environment Centre*, Lancaster University, UK, 2011.

[2] N. Lathia, S. Ahmed and L. Capra. Measuring the impact of opening the London shared bicycle scheme to casual users. *Transportation Research Part C: Emerging Technologies*, 22: 88-102, June 2012.

[3] J. Wood, A. Slingsby and J. Dykes. Visualizing the dynamics of London's bicycle hire scheme. *Cartographica*, 46(4): 239—251, 2011.

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