Simulating e-scooter ride sharing

DSSC Project Proposal

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Project Plan - Recap

1. Build a model to simulate demand and journeys of a shared e-scooter system
2. Empirically asses (and tune) the model using e.g. data visualization
3. Analyse the resulting data

Building a model - Recap

- We will need to simulate the following:
  - A city environment incl. population distribution, city layout
  - Scooter demand incl. variation throughout the day
  - Journeys incl. destinations, routes

Animating Journeys

- We can animate demand and journeys
- This has proved very helpful for debugging

Heatmaps

- We can use heatmaps to visualize most travelled streets

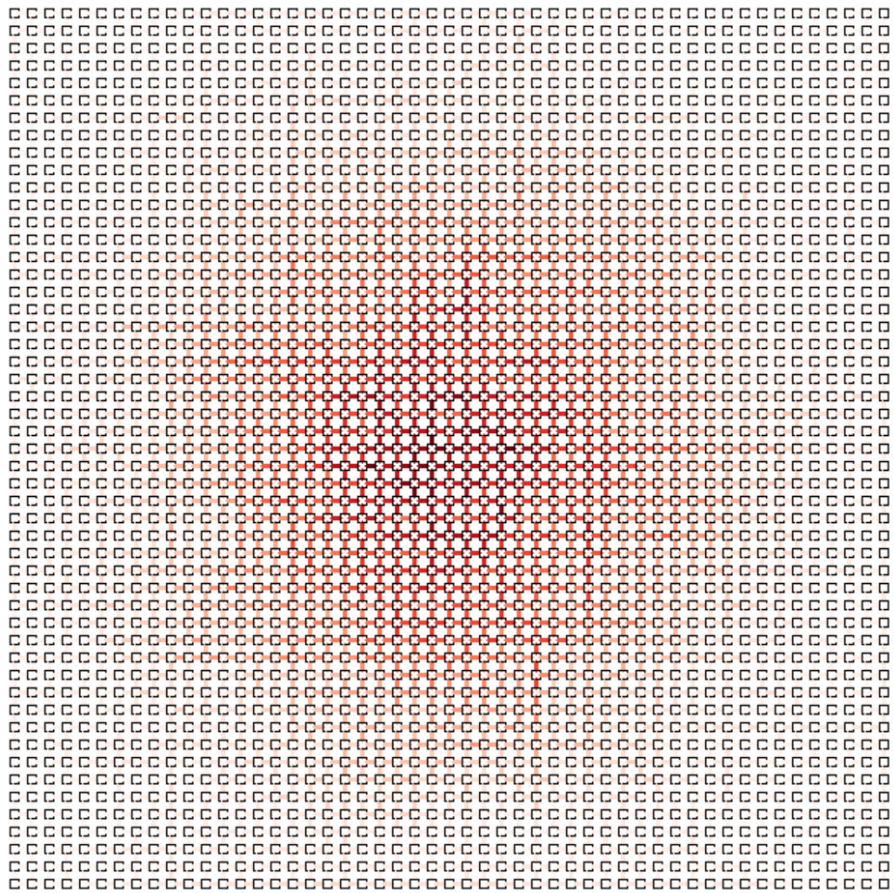

Figure: Heatmap indicating volume of travel on each street, (darker=more volume)

An extension : multiple destination hubs

- Currently requests and journey destinations are sampled unimodally
- We can easily extend our model to handle multiple popular destination hubs e.g. work sector, train station etc.
- This can be done for example by sampling a destination from a Gaussian Mixture

An extension : multiple destination hubs

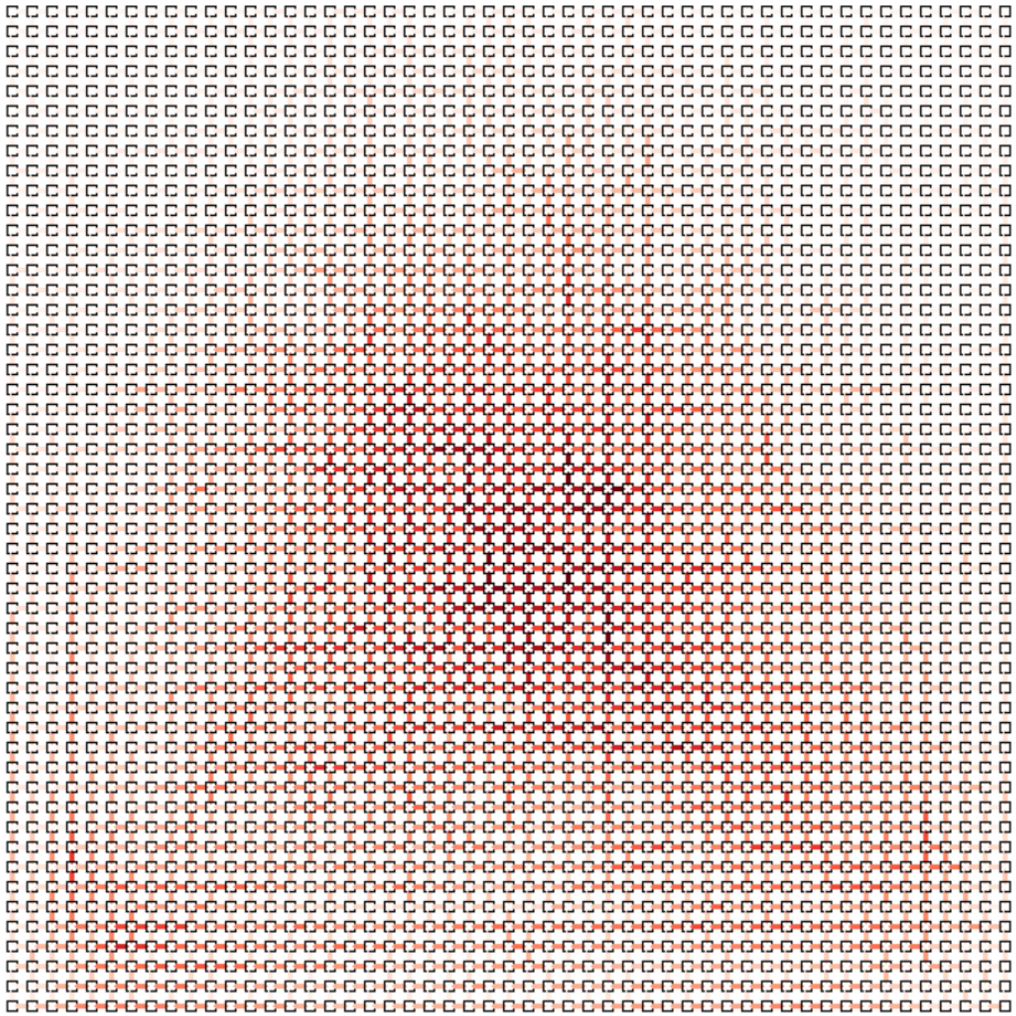

Figure: Heatmap with multiple destination hubs

Plan for next week

- Using a basic cost model for operating a scooter service can we:
  - Identify an optimal number of scooters for a city
  - Find an optimal placement for the scooters at the start of a day

Questions?