

Imaging the City:

Data simulation in space & time

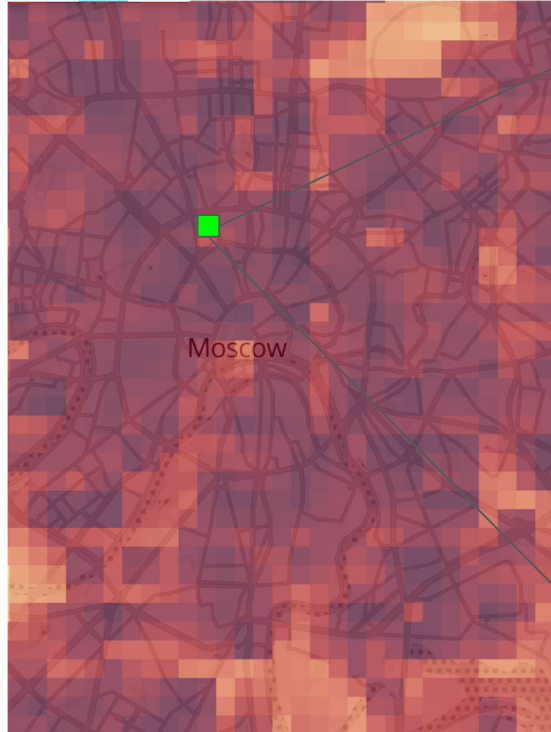
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What-If Analysis: Let's build a Community Center

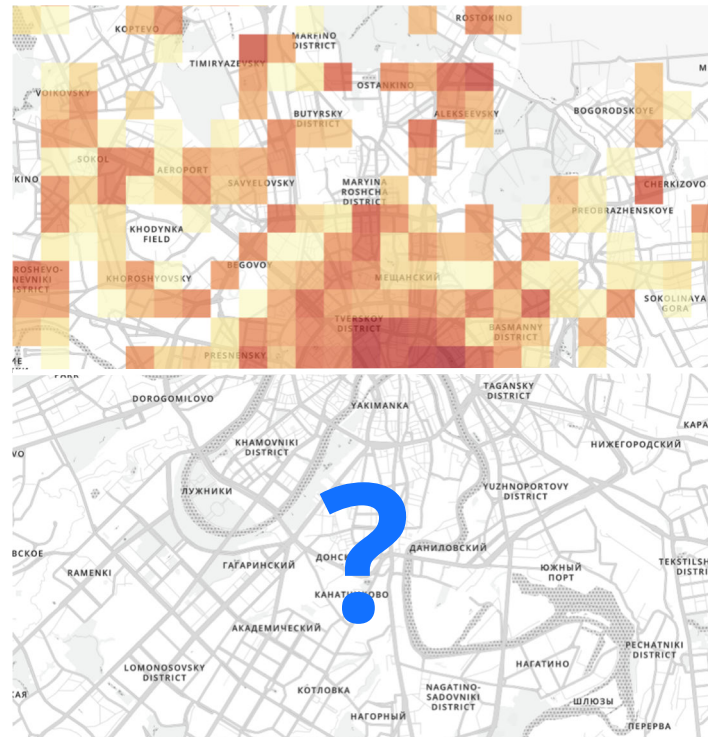


Understanding the Economic Impact

Prediction of a City Map



Activity



Spend

City Map: Discrete vs Continuous

What is the best representation of the city data to learn the spatial patterns?



Continuous



Discrete

?

City Map: Discrete vs Continuous

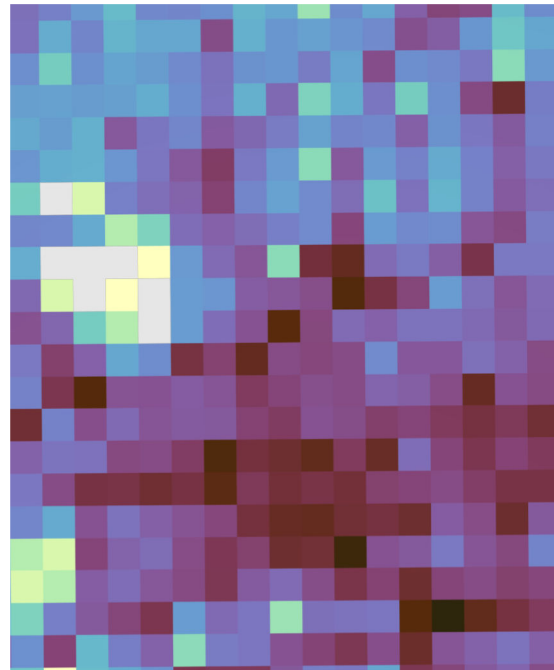
What is the best representation of the city data to learn the spatial patterns?



Continuous



Discrete



Raster

Our Choice: Grid Cell

A universal data point

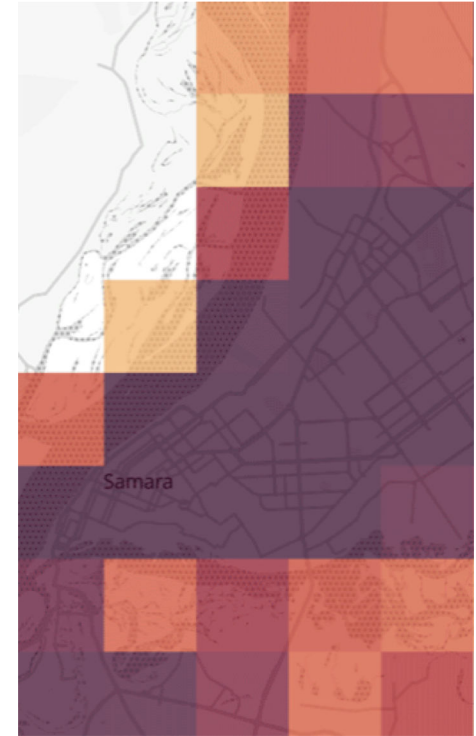
Different spatial scale: 10m to 10km

Uniform throughout the city

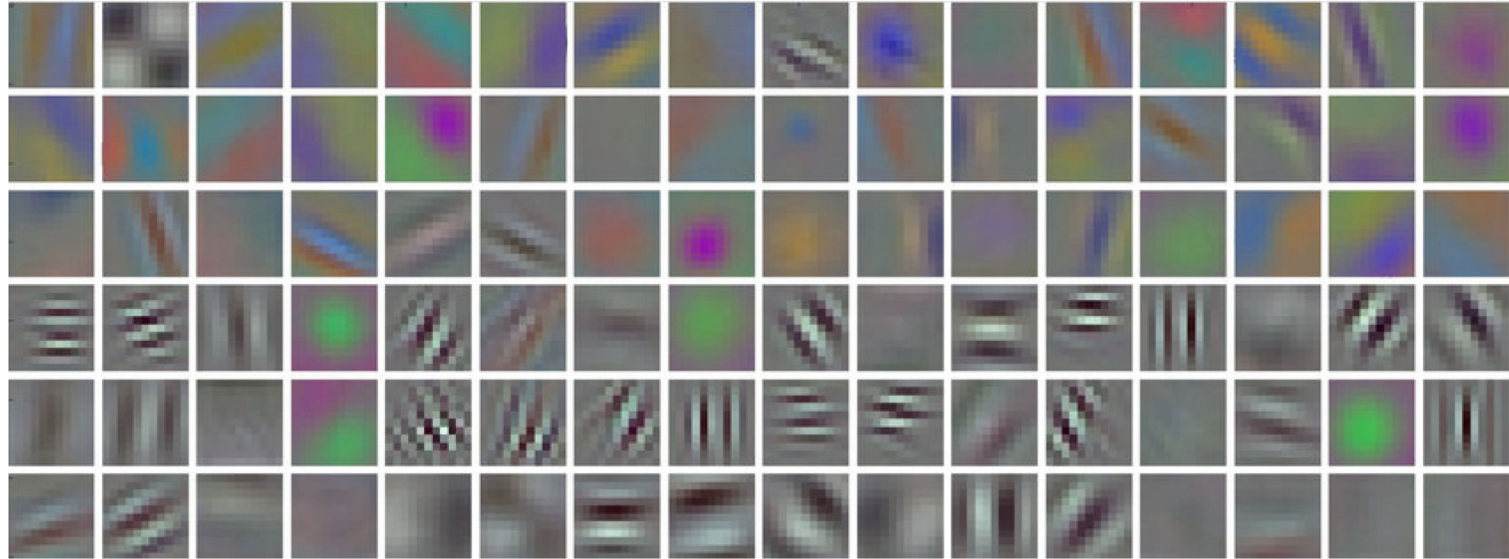
Comparable across territories

Fast computations

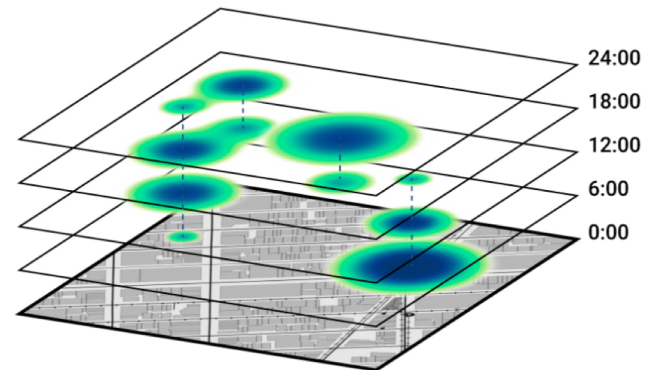
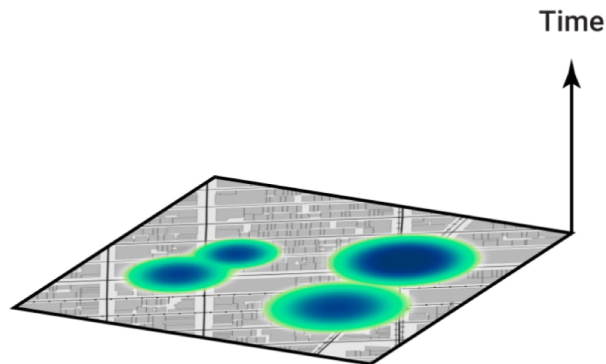
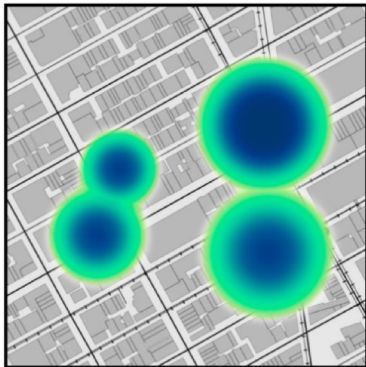
Relationship between adjacent cells



Convolutional Neural Network: Spatial Patterns Champion



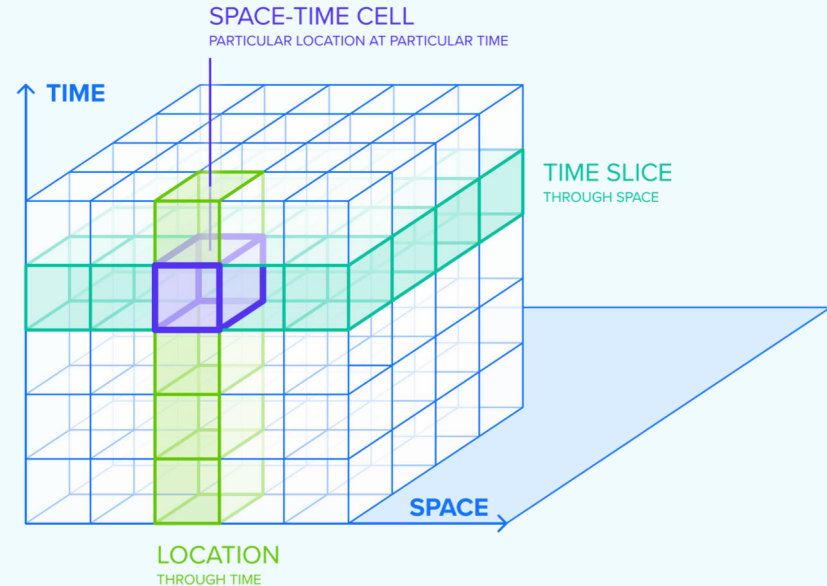
Viewing Map through Time



Chronotope Grid

Chronotope Grid is a data standard and database for space-time data.

Chronotope Grid allows aggregation, processing and storing data with location and time attributes.



Simulation Limitations

- **Only a certain level of spatial granularity: not a small shop simulation**
- **Requires some minimal area to work: at least a 10 by 10 km city**
- **Works best as a rapid scenarios exploration tool**

Next Steps

- **Prediction for multiple categories of spend: Grocery vs Entertainment**
- **Adding data layers as input image channels: POI density, zoning**
- **Generation of maps for desert areas: starting without and input**