ETH zürich

Projects in Machine Learning Research

VAST Challenge 2022

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1 Introduction

VAST stands for Visual Analytics Science and Technology

This year, the challenge was to analyze various behavioral patterns of a fictitious city

We focussed on one of the sub-challenges called “Patterns of Life”

The challenge is to find busy areas in town, traffic bottlenecks or hazards and compare the daily patterns of different participants

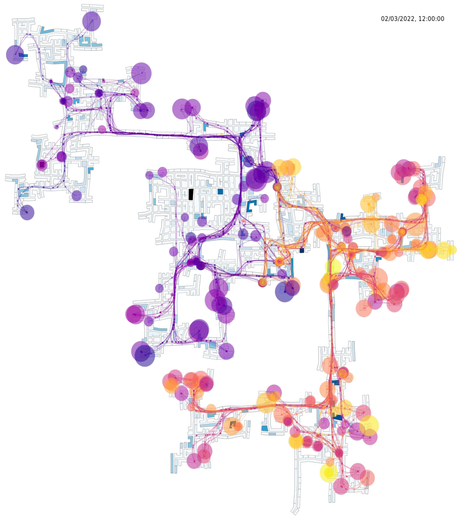
2 Data

The dataset consisted of three types of data:

1. Activity logs, tracking the location and additional information such as hunger status, etc.
2. Non-changing attributes for buildings, employers and jobs
3. Journals about social interactions, financial transactions and travels.

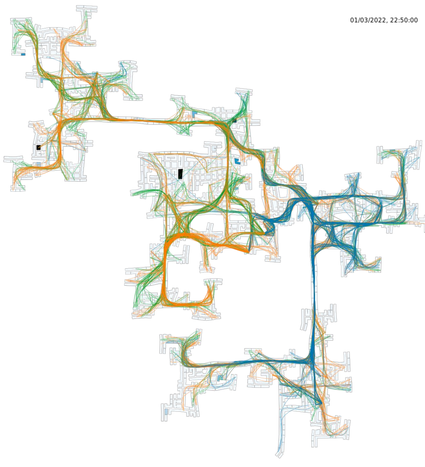
3 Our Application

- Use of Observable Notebooks to display datasets
- Allowed us to filter participants by age, education level and other criteria
- We displayed participants’ trajectories over time and the places they stayed are represented by dots.



Trajectories Trends

Participants with low joviality cluster in distinct regions of the town



Traffic Map

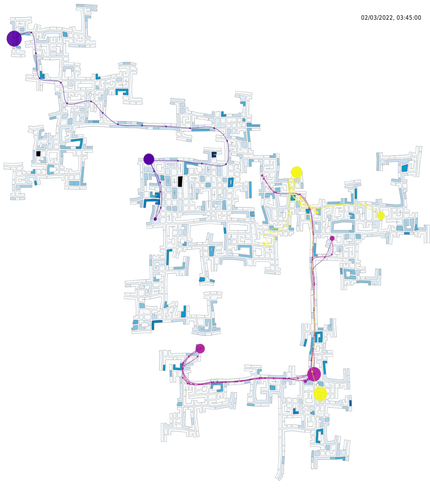
Shows busy intersections and areas of the city

Detection of bottlenecks and congestion sources

Individual Trajectories

Comparison of participants trajectories

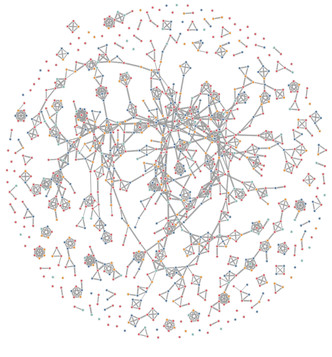
Easy to investigate changes in the daily routine of participants



Proximity Network

Shows evolving interactions between individual participants

Makes evident shared attributes within social clusters and changes in social clusters over time



4 Next steps

- Clustering based on trajectories
- Visualise how patterns change over time
- Train a model to predict the goodness of business locations
- Propose improvements to infrastructure to alleviate bottlenecks

What are your guesses ?