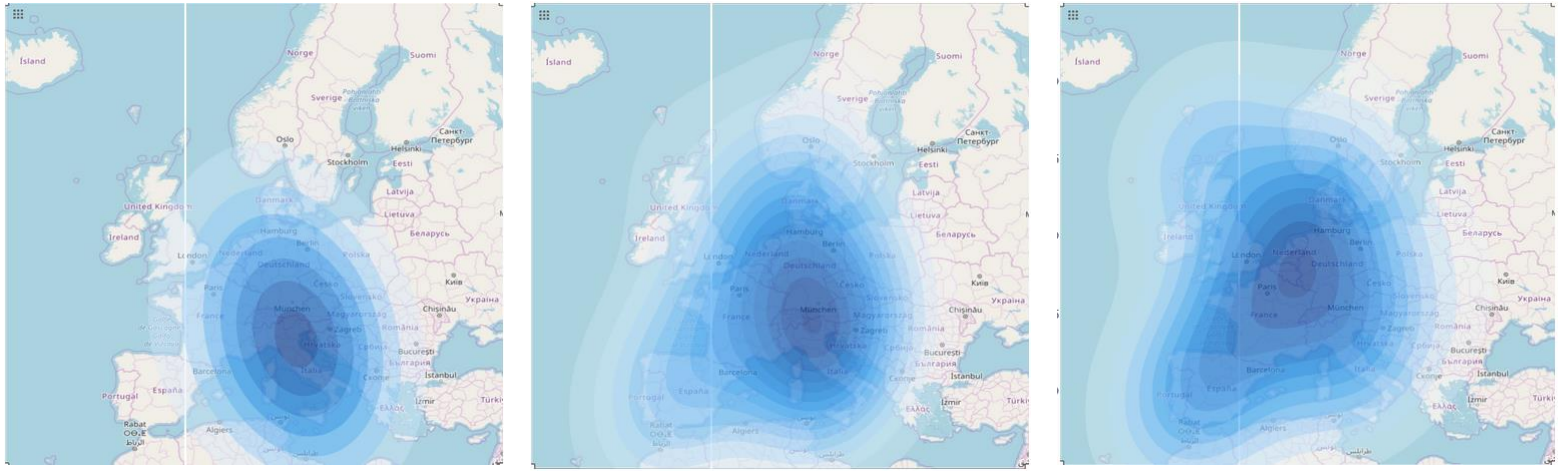

VU Visualisierung 2 (186.833)

Spread of Covid-19

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Short Data Summary

- Our dataset consists of data of Covid19 spread across world.
- Source: Kaggle
- It contains number of cases per country from 22th of January until 16th of April.
  - First case in Europe 24th of January
  - As of 17th of March all countries in Europe have confirmed cases
  - Until 16th of April there are 965488 confirmed cases in Europe
- Questions we plan to answer:
  - Spread patterns of Covid-19
  - How Covid-19 spread trajectory looks like

Technique Summary

- Their technique approximates the underlying distribution of non-directional data over time through the application of a 2D kernel density estimation.
  - $f_{2D}(x,y) = \frac{1}{N}\sum_{i=1}^{N}\frac{1}{h^2}K(\frac{x-x_i}{h},\frac{y-y_i}{h})$,
    - N – number of samples, h- bandwidth of kernel, (x,y) – location longitude and latitude.

1. Functional representation of spatiotemporal data (using KDE)
2. Flow map extraction (gravity-based flow extraction model)
3. Visualization

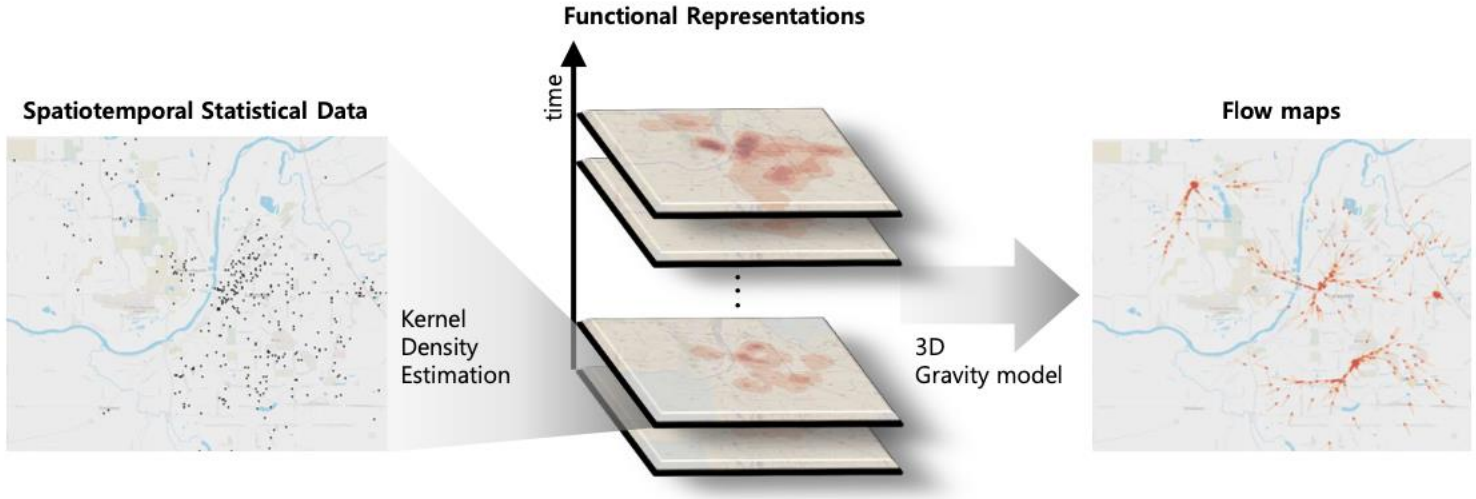

Fig 1: Visual overview of the system

Implementation

- We focus our implementation in Europe and ignore the data we have on other countries.
- For visualization we use plotly library.
- As for 2D KDE we need to reimplement a weighted 2D KDE.
  - We reimplement scipy.stat.gaussian_kde to weighted kde
  - For comparison we also use kdeplot from seaborn package
- We might need to use Gaussian Kernel instead of Triweight Kernel because there are much more information for 2D Gaussian KDE.

Group Name

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Data Flow Analysis and Visualization for Spatiotemporal Statistical Data without Trajectory Information

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