



Spatial DB Project

My Big Fat Greek Truckjectories

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- 2 Trajectory Data Mining – Pre-processing
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1 My Big Fat Greek Truckjectories?

Pre-processing of Trajectory Data

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Abstract With the increasing trend of mobile internet usage, the amount of trajectory data generated by end users is growing rapidly. The analysis of such data opens up new insights into the user behavior. To be able to perform data mining tasks on this trajectory data, it is necessary to carry out an extensive pre-processing. This paper first describes the representation forms and classification possibilities for trajectory data, and then provides an overview of the possibilities of the pre-processing methods. In addition, some specific algorithms are presented that have been found to be particularly useful and efficient for the pre-processing of trajectory data.

1.1 Implementation of the used algorithms in my paper
„Pre-processing of Trajectory Data“

1.2 Greece, Trajectories, Trucks
= The Greek Trucks Dataset



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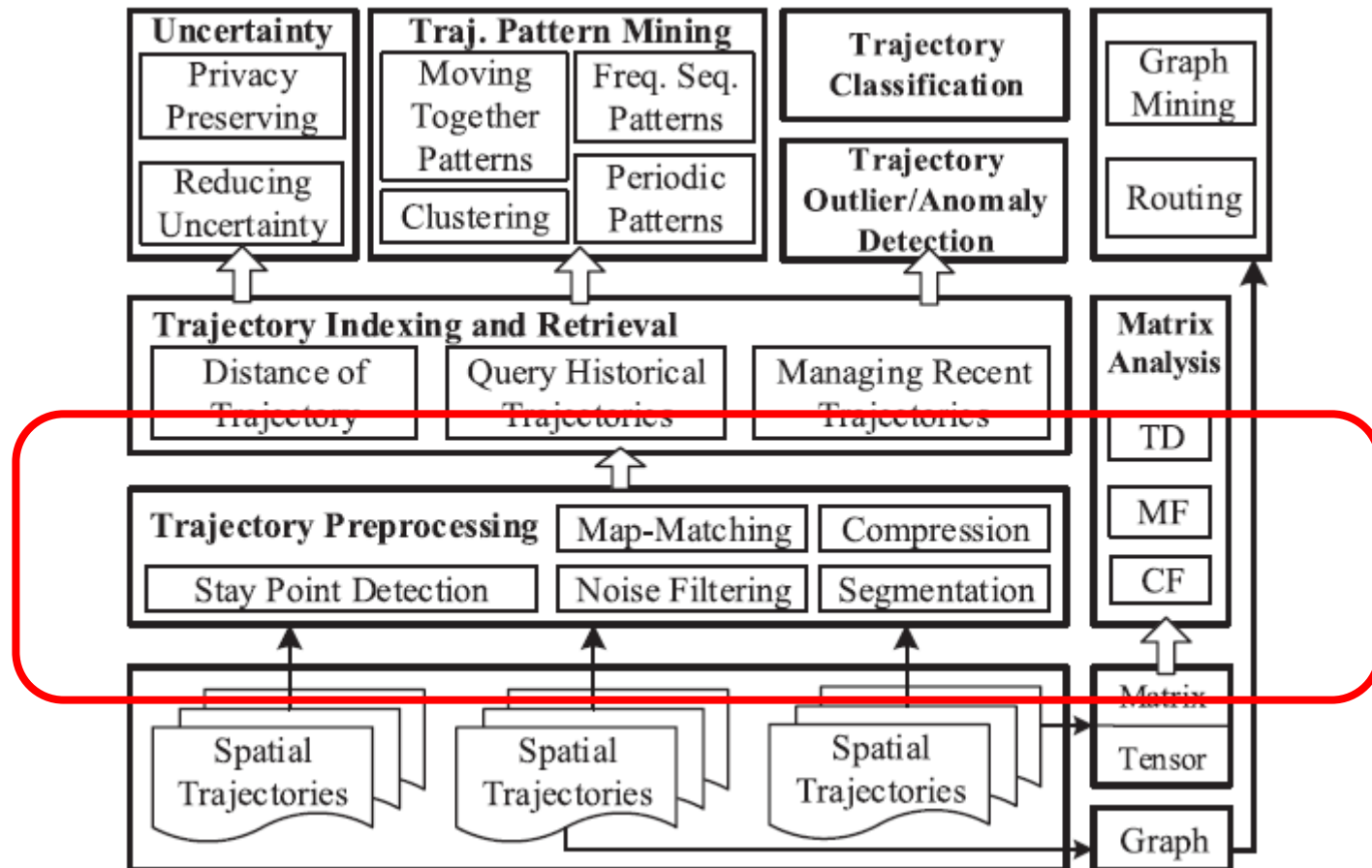
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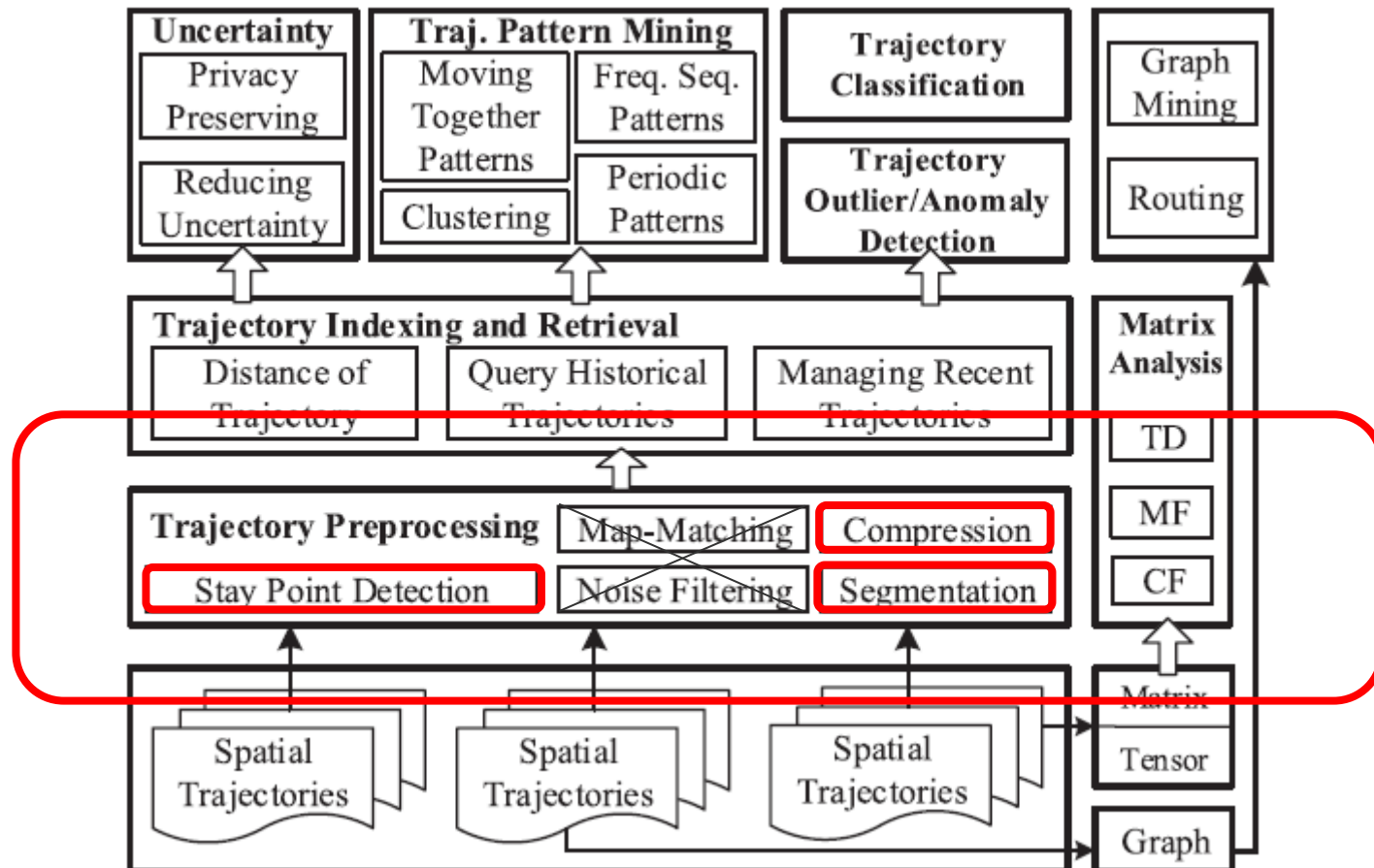


2 Trajectory Data Mining – Pre-processing





2 Trajectory Data Mining – Pre-processing



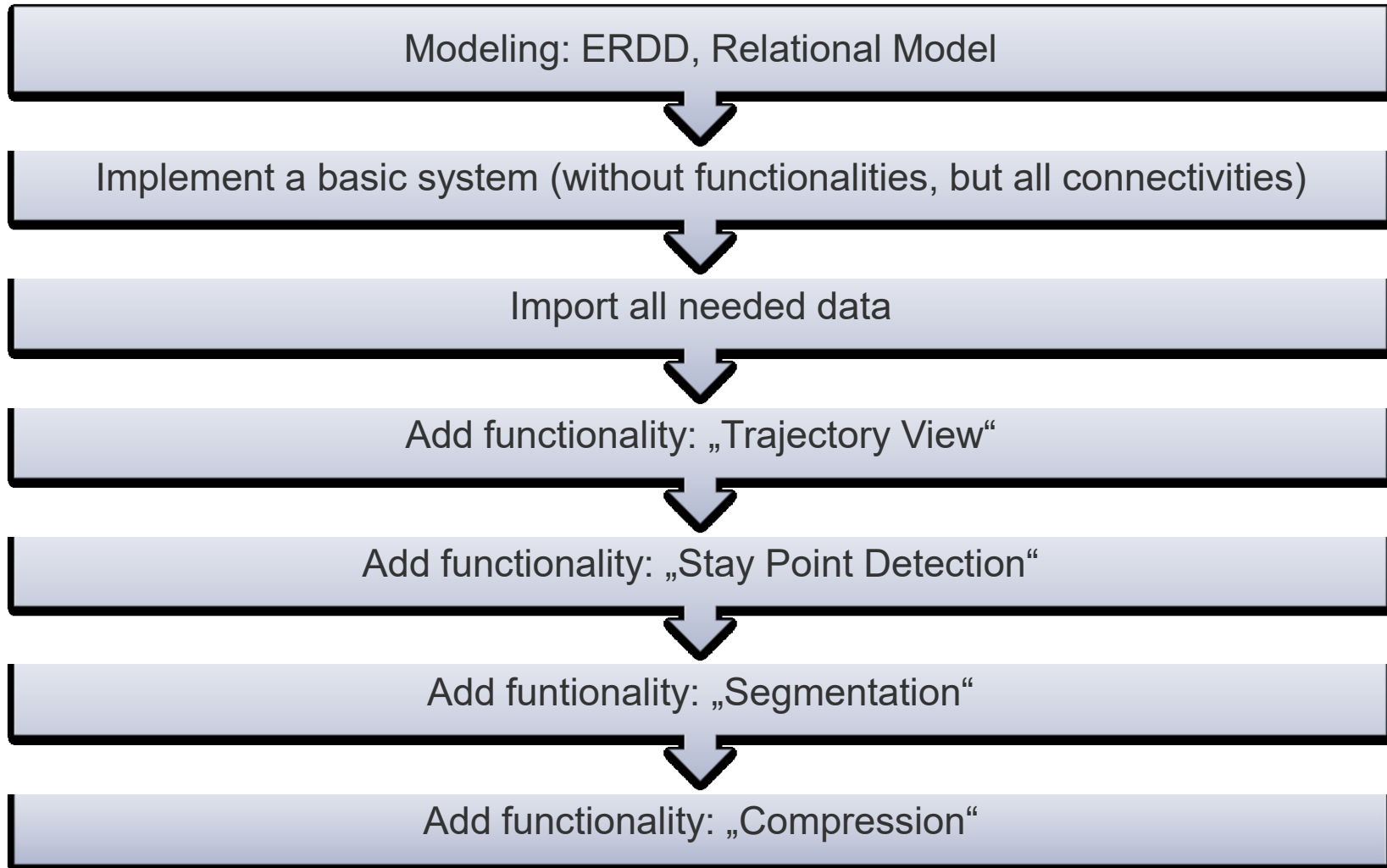


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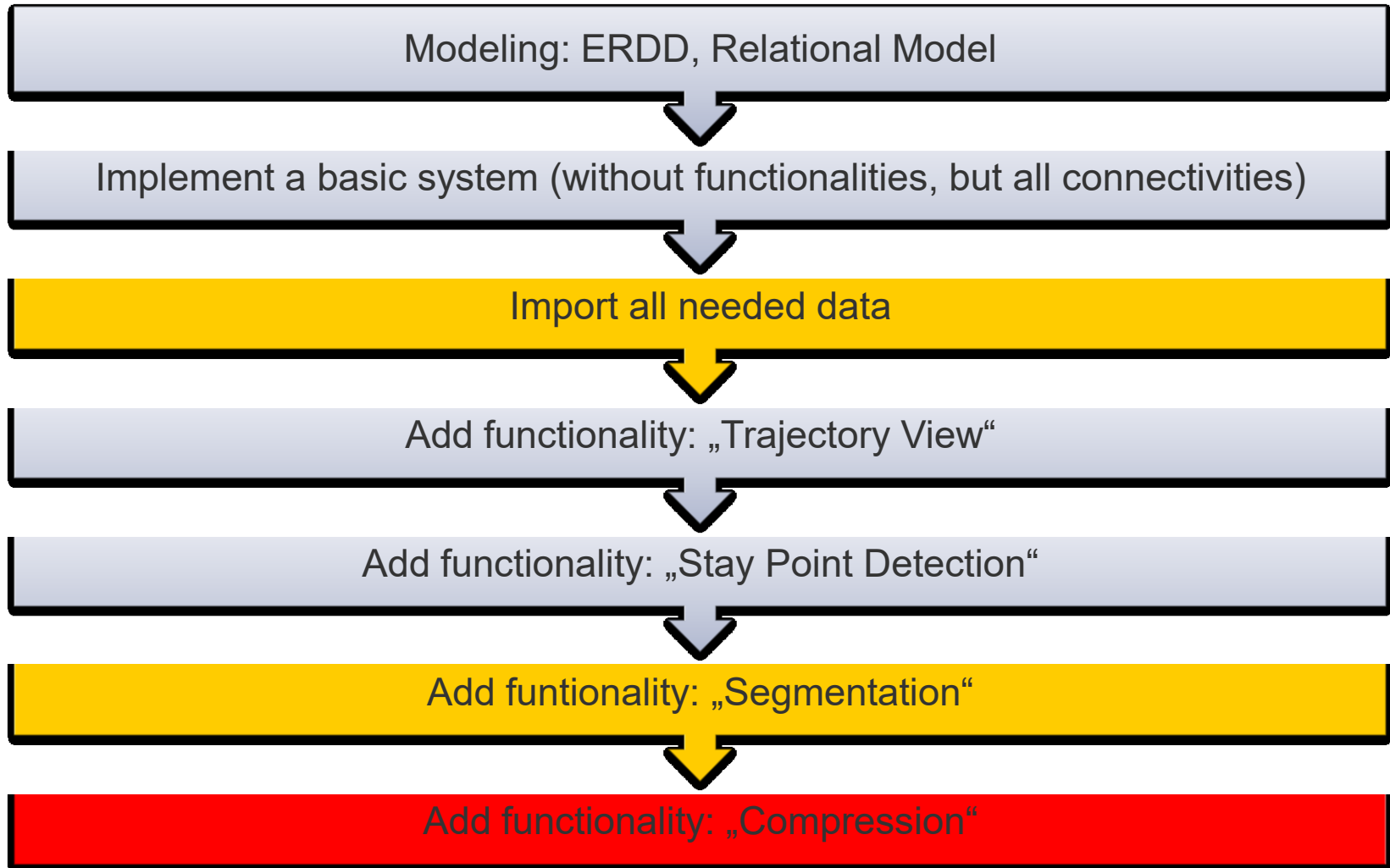


3.1 Project Design: Planing





3.2 Project Design: Problems



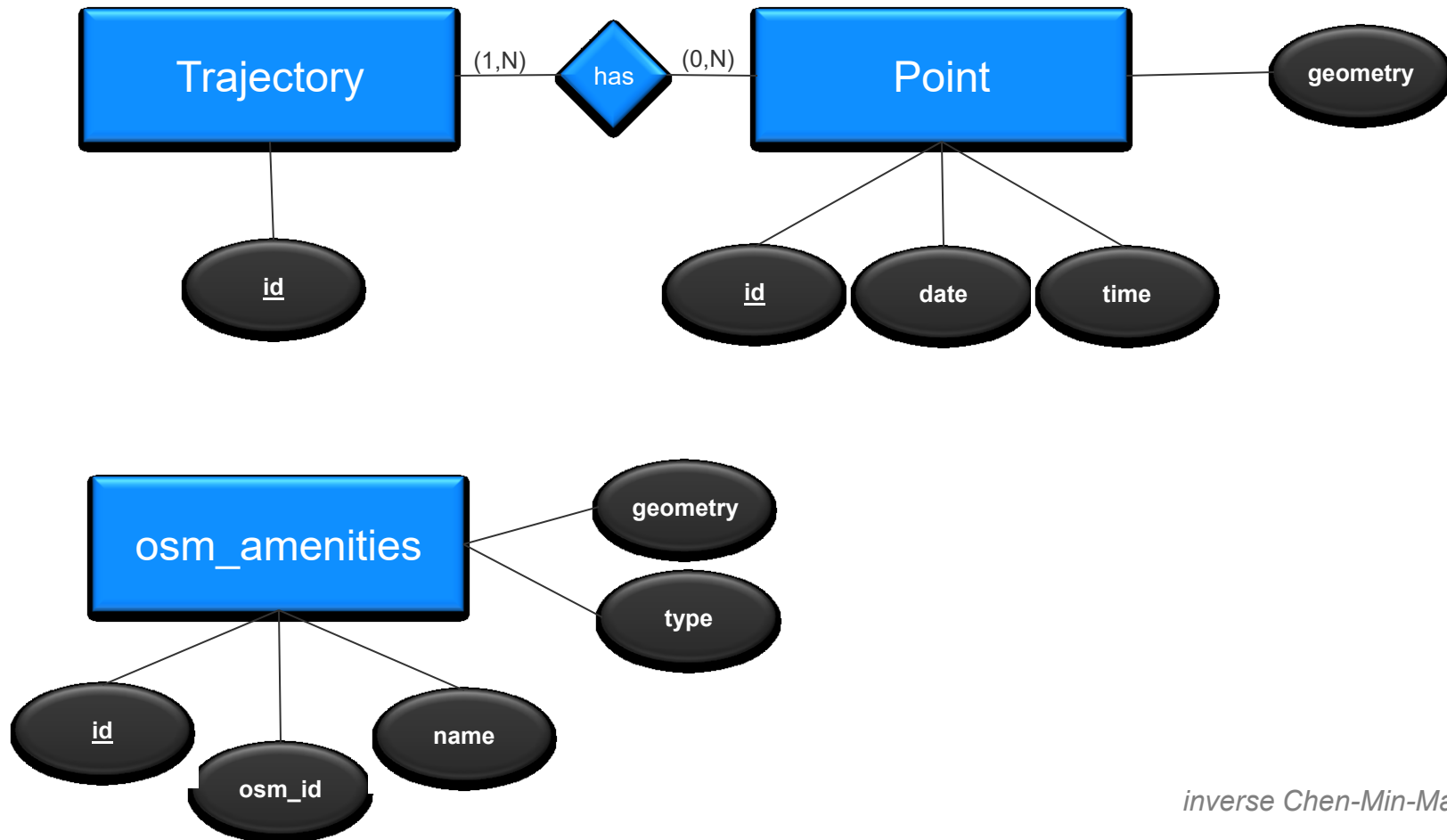


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4.1 Modeling: ERDD



inverse Chen-Min-Max notation



4.2 Modeling: Relational Model

Point(id:*integer*, date:*date*, time:*time*,
geometry:*POINT*(SRID4269));

Trajectory(id:*integer*);

hasTP(tid*:*integer*, pid*:*integer*);

osm_amenities(id:*serial*, osm_id:*bigint*,
name:*varchar*, type:*varchar*,
geometry:*POINT*(SRID3857));



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5 Technologies

5.1 PostgreSQL 9.4.x with PostGIS 2.x

5.2 Apache Webserver („httpd“)

5.3 PHP 5.x with PostgreSQL extension

5.4 Twitter-Bootstrap 3.x (jQuery)

5.5 Javascript (Leaflet)









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6.1 Project Status

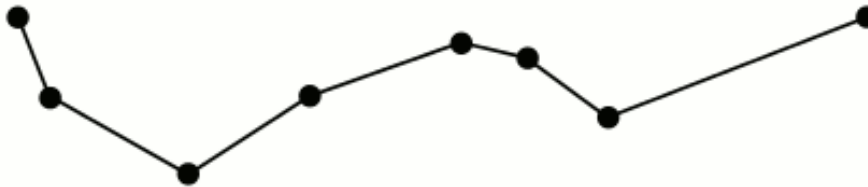
DONE		IN PROGRESS	
Trajectory View		Compression (<i>Douglas-Peucker algorithm</i>)	
Segmentation (<i>Time-interval based</i>)			
Stay Point Detection			

6.1.1 Douglas-Peucker algorithm could also be used for segmentation.

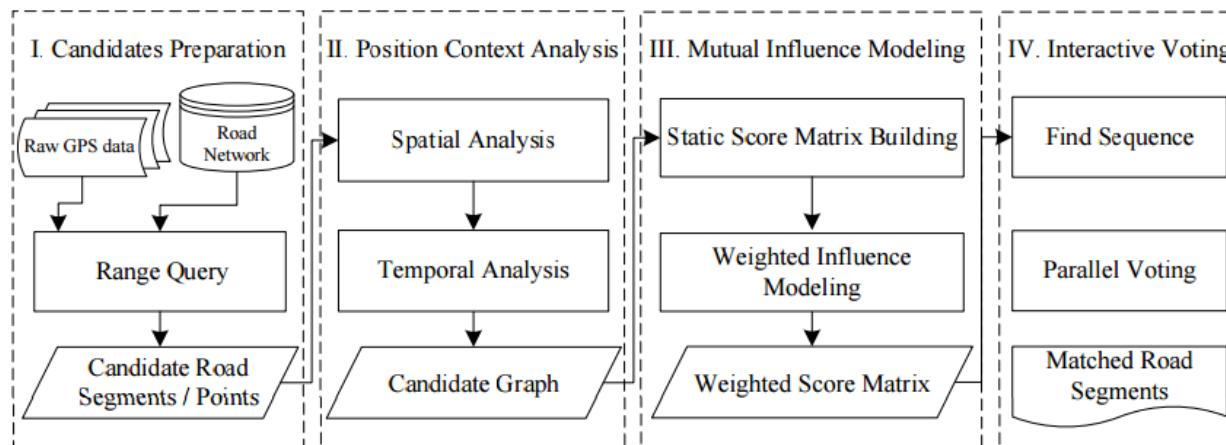


6.2 Further Steps

6.2.1 Compression with Douglas-Peucker algorithm



6.2.2 Map-Matching with IVMM algorithm



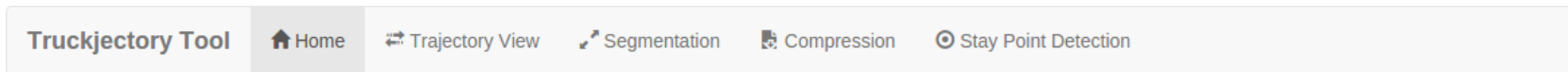


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7 Live Demo: „Truckjectory Tool“



Welcome to "Truckjectory Tool"!

This tool was designed to visualize and analyze trajectories based on the famous record "Trucks" published by ChoroChronos.org.

Trajectory View

The tab "**Trajectory View**" enables the user to visualize a single trajectory or a set of trajectories. The sidebar contains selectable trajectories.

- Selecting a trajectory will visualize it on the map in the main window.
- Deselecting the trajectory will drop the trajectory from the map.

Segmentation

The tab "**Segmentation**" enables the user to split a single trajectory into smaller parts for further analysis. The sidebar contains a trajectory selector, a selector of the kind of segmentation and the button "Compute".

- Use the dropdown menu to select a trajectory. The chosen trajectory will be visualized in the top window.
- Select a segmentation method.
- Press the "Compute" button. The computed segmented trajectory will be visualized in the bottom window.



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8 References

8.1 Nicolas Lehmann,
„Pre-Processing of Trajectory Data“,
Freie Universität Berlin, January 2016

(Seminar paper: Data Visualization and Data Mining)

8.2 The Greek Dataset

(<http://chorochronos.datastories.org/?q=node/5>)

All links last followed on 04.02.2016, 12 pm.



That's it!

Any questions so far?

