Personal devices, such as mobile phones and fitness trackers, have become a feature of everyday life. These devices generate masses of data on the movements of large populations. These datasets have opened up new opportunities and encouraged researchers to study the impact of human travel on the built and natural environment.

Data are collected through many technologies and vary in spatial and temporal resolution. Spatial resolution determines the precision of the current location of the device. For example, the location may be determined with high precision up to a few metres or with low precision when assigned to city districts. Temporal resolution defines the frequency of location updates.

An important part of the study of human movement patterns is in the prediction of trips. Advance knowledge of where people will travel is beneficial for applications, such as road network designing, city planning, infectious disease spread modelling and service provision. It is possible through the predictability of human movement, which has been proved to be non-random. People live to circadian rhythm and tend to visit places that are important for them, such as home, work and local shop with predictable regularity.

In order to analyse the human movement using data collected from mobile devices processing the data in its raw form is the mandatory first step. Due to the increasing popularity of human movement studies, a great variety of processing methods have already been proposed. Current research into predicting human movement focuses on the computation of human travel in the creation of the best prediction algorithm. However, the results of these studies show inconsistencies. Even when the same data processing methods and prediction algorithms are used, results can be very different. The reason for this is often as a result of a variation in chosen data processing methods and different resolutions of data used for these analyses. This questions the credibility of human movement studies. It is currently difficult to assert the impact that ill-chosen processing methods and data resolution have had on the results.

In this project, we aim to fill the gap in this knowledge by providing a way for human movement researchers to assess how these factors impact on their results. Due to the diversity of processing methods and the complex relationship between these methods and the spatio-temporal characteristics of movement data, they cannot be directly compared. Therefore, a comparison of these methods requires the creation of a unified set of measures independent of the chosen method and characteristics of the data. We plan to develop a solution by creating a toolbox for the qualitative and quantitative assessment of processing methods of human movement data. Furthermore, we plan to release the toolbox on an open license.

In order to develop the tools, first, we plan to fully investigate the impact of spatio-temporal resolution and data processing methods on predictions of human movements. This knowledge will be necessary for designing and creating the proposed tools. We plan to evaluate the processing methods used in current research and propose the best data processing workflow.

As an outcome, we hope to understand how data processing and the spatio-temporal characteristics of the data influence human movement predictions. This knowledge will be an important step towards more accurate and reliable research into human movement. We believe that our proposed toolbox will facilitate the selection of the most suitable methodology for the processed data and will encourage the development of new, better processing methods that will improve the quality of research.