

# Interactive Visual Exploration of Time-Use Data

## Time geographical analysis of individuals' activities within populations

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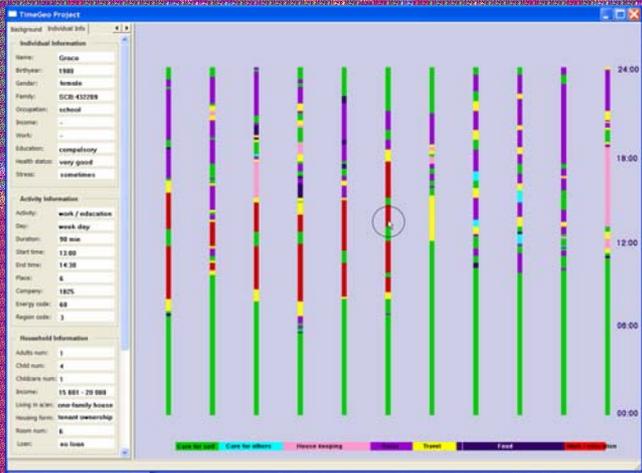
Social scientists often wish to understand a population as a set of individuals instead of as an indistinguishable mass with bulk statistical properties. The aim of this project is to develop novel tools which permit the study of the time-use of sets of people in their everyday lives, thus creating the potential to highlight interesting behavioural features.

### DATA

Time-use data is in the form of diaries which have been collected for 462 people (ranging from 10 to 97 years old) who have logged their performed activities, their company and location during one weekday and one weekend day, with a 5 minute resolution. The activity data is divided into six different general categories or 'activity spheres' and has five levels of detail. There are 900 activity codes in the highest level of detail. A graphical user interface allows the user to dynamically create queries on the diary database. The specified population is then extracted, visualized and made available for further analysis.

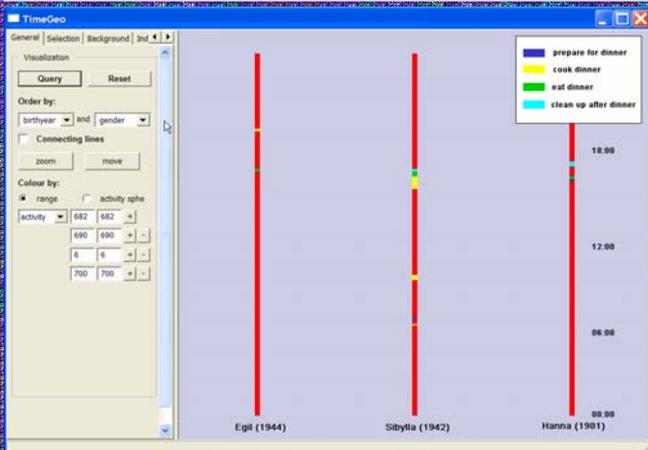
### INTERACTION

The user can interact with the visualization freely. **Rotation, scaling and moving** the visualization is possible. Furthermore a **picking** function is available: clicking on an individual in the visualization window will drill-down by returning more extensive information about the individual and the activity at the picked time point.



### COLOUR CODING

Colours are used to denote the different value ranges. Colour coding is also used to identify ranges of selected activities or other information. A single range or a series of ranges can be selected and highlighted in the visualization.

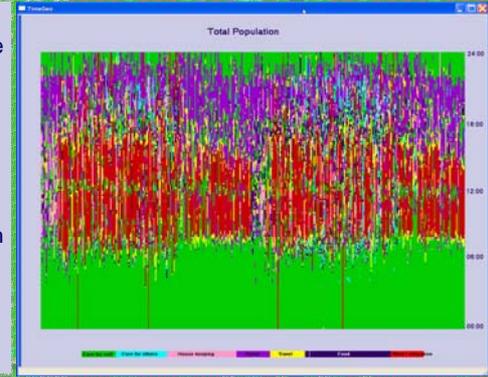


### VISUALIZATION

The visualized data is represented as tubes in a coordinate system. The x-axis holds the members of the population, the y-axis is the time axis while the z-axis is variable holding the activities, the company or the places.



For every individual on the x-axis, each activity, companionship or place is represented by a tube positioned within a certain value range on the z-axis and stretching from a start to an end point in the time axis. Connecting lines are drawn between activities. The side view of the visualization shows an individual path of activities, places or companies. The front view of the visualization shows the real-time representation of an individual's time use.



### STATISTICS

General statistical information concerning the visualized population can be calculated and then displayed or printed.

The screenshot shows a 'STATISTICS' window with a table of data. The table has columns for 'Activity', 'Active Occurrences', 'Σ', 'tot duration', 'Σ', 'pop / population', 'perc / active', 'min duration', 'max duration', and 'mean duration'. The data is summarized for various activities and a total population count.

Activity	Active Occurrences	Σ	tot duration	Σ	pop / population	perc / active	min duration	max duration	mean duration
0	462	4812	33.26	747.84	55.66	10.42	6	603	407.50
Emergency	662	4812	33.26	747.84	55.66	10.42	6	603	407.50
100	220	945	6.47	229.76	20.96	7.09	4.23	110	110.00
200	220	945	6.47	229.76	20.96	7.09	4.23	110	110.00
201	220	945	6.47	229.76	20.96	7.09	4.23	110	110.00
202	220	945	6.47	229.76	20.96	7.09	4.23	110	110.00
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