By Alessa Gross
M.Sc. Interactive Digital Media
Supervisor: David Kaneswaran
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Interactive Data Visualisation

Applying an interactive data visualisation to Irish road accident data to study usability and memorability.

Abstract

The digital revolution in recent years has led to various data gathering devices and services which have become common in everyday life. It also has led to the big data discussion that deals with the questions of what to do and where to go with these information in numbers and text? One approach is to make sense of the incomprehensible amount of data in a human-comprehendible way through informative visualisations of the data. This has recently contributed to various different studies on the data visualisations and especially interactive data visualisations. Research in interactive data visualisation touches, amongst others, the fields of computing, design and human computer interaction. However, it is still a relatively young field of research and hence the formula to quickly find the best visual representation for every data set has yet to be found. Therefore the full range of features that make a good visualisation, and enhance comprehension and memorability of the presented information cannot be clearly defined.

For this study, an interactive data visualisation has been created that illustrates road accidents in Ireland in 2010. The design decisions for it were based on the findings of current research. The visualisation focuses on a compact representation and easy access of the presented information. It was implemented with modern web- and visualisation tools.

In an experiment the visualisation was compared to another interactive data visualisation and a static visualisation that are both based on the same data set. The experiment investigated the response time and response accuracy of participants that were asked to answer specific questions with the help of one of the three visualisations. It also tested the participant's memorability on information they got from the visualisations. Furthermore, the participants were asked for their personal perception of the visualisations. The results of this experiment showed a relationship between a quick response time and a low memorability as well as a high usability and a good user perception. The results of the experiment of this work add to the clarification of the above named questions on the features of interactive data visualisations.