

Mid July 2021, the MX3D smart bridge was placed over the Oudezijds Achterburgwal canal in De Wallen, Amsterdam. It is a modern-looking, 3D printed bridge that, besides the functionality of letting people cross over the canal, tracks data for research purposes. For this bachelor's thesis, "Data Representation of the MX3D Bridge", research is conducted about how the public could benefit from the data collection, by visualizing the data collected by the MX3D bridge. The assignment related to this thesis has also been to work on the website and an interface that explains the data collection and shows different outputs of sensors. The thesis will revolve around the question:

*How can an interface be designed, which shows data collection by an Internet of Things bridge, properly show and inform the public about the data collection and be transparent about the data collection towards the public?*

Research is performed in order to gain information and knowledge about data visualisation. Through a survey, it has been found that the public is not interested in seeing all data collected by the bridge, rather the kinds of data they are familiar with like load and temperature. Although Amsterdam has signed a manifesto that has the principle of sharing all data that is collected in public space with the public, the public is not necessarily interested in *all* data. The outcomes of the survey as well as the principles of the municipality of Amsterdam are used to design an interface that shows the data, and make recommendations to the current website of the smart bridge in Amsterdam.

Data is collected by the bridge through seven different types of sensors, of which the cameras anonymously collect data of the public. The other sensors on the bridge collect data about environmental influences on the bridge and the bridge's behaviour. Not only can this help with crowd control in the city of Amsterdam, the main goal of the data collection is research the behaviour of the unique 3D-printed metal that the bridge is made from. By collecting data about environmental influences and compare this to the bridge's behaviour, a better understanding of the material can be created.

The fact that data is collected by the bridge, and some of the data is collected by cameras that collect data from the public, the public has to be properly informed about the data collection, and they have the right to know why and what data is collected (European Union, 2021) (TADA, 2017). By digitalizing the collected data, and sharing it online, it is open and accessible to the public, and anyone who would want to, can be informed about the bridge and its data collection, hence why a website of the bridge is created. During this assignment, "the website" and "the interface" are distinguished. On the website, information can be found about the MX3D bridge, and

on the website the interface can be found. This is a interface built within the website, that shows the live data collected by the sensors on the bridge. The final interface shows some of the live data collected by the bridge as sparklines, lines that give an indication of the data compared to previously measured data values, without sharing the detailed values. The load, which is an indication of the current mass on the bridge, is shown as a pie chart that represents the ratios of load measured by load cells on different locations of the bridge.