

A lighting infrastructure for data visualisation on the 3D printed bridge by MX3D

The design challenge of this thesis was to develop a lighting infrastructure for the sensor-instrumented 3D-printed stainless steel MX3D bridge to visualise the dynamically generated data, while taking into account human interaction and experience, architectural design, and smart lighting technologies.

The following valuable use was found for the lighting infrastructure:

Busyness

- Number of people on the bridge (incl. avg. walking speed and walking direction).
- Number of people crossing the bridge per time period.
- Average time spent on bridge.

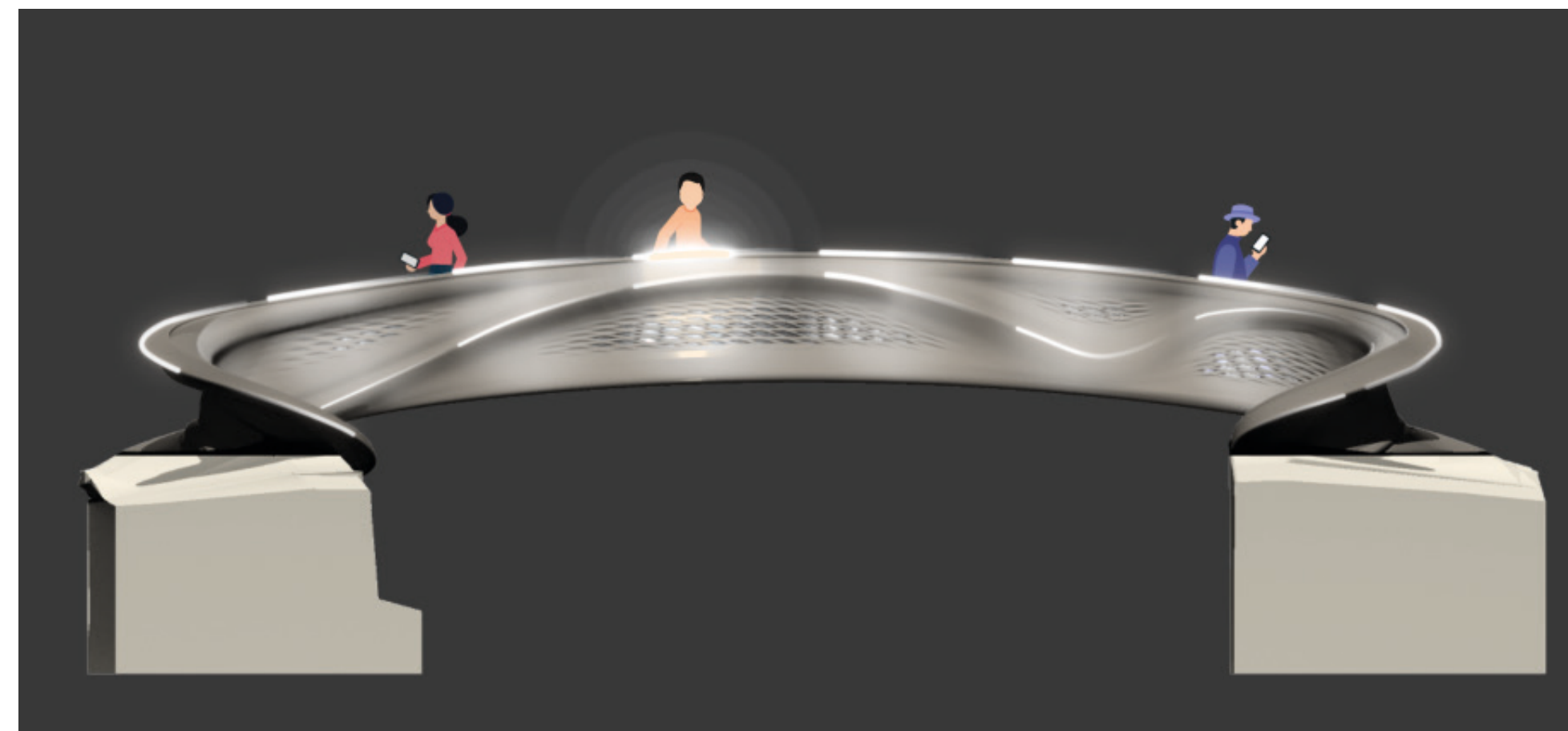
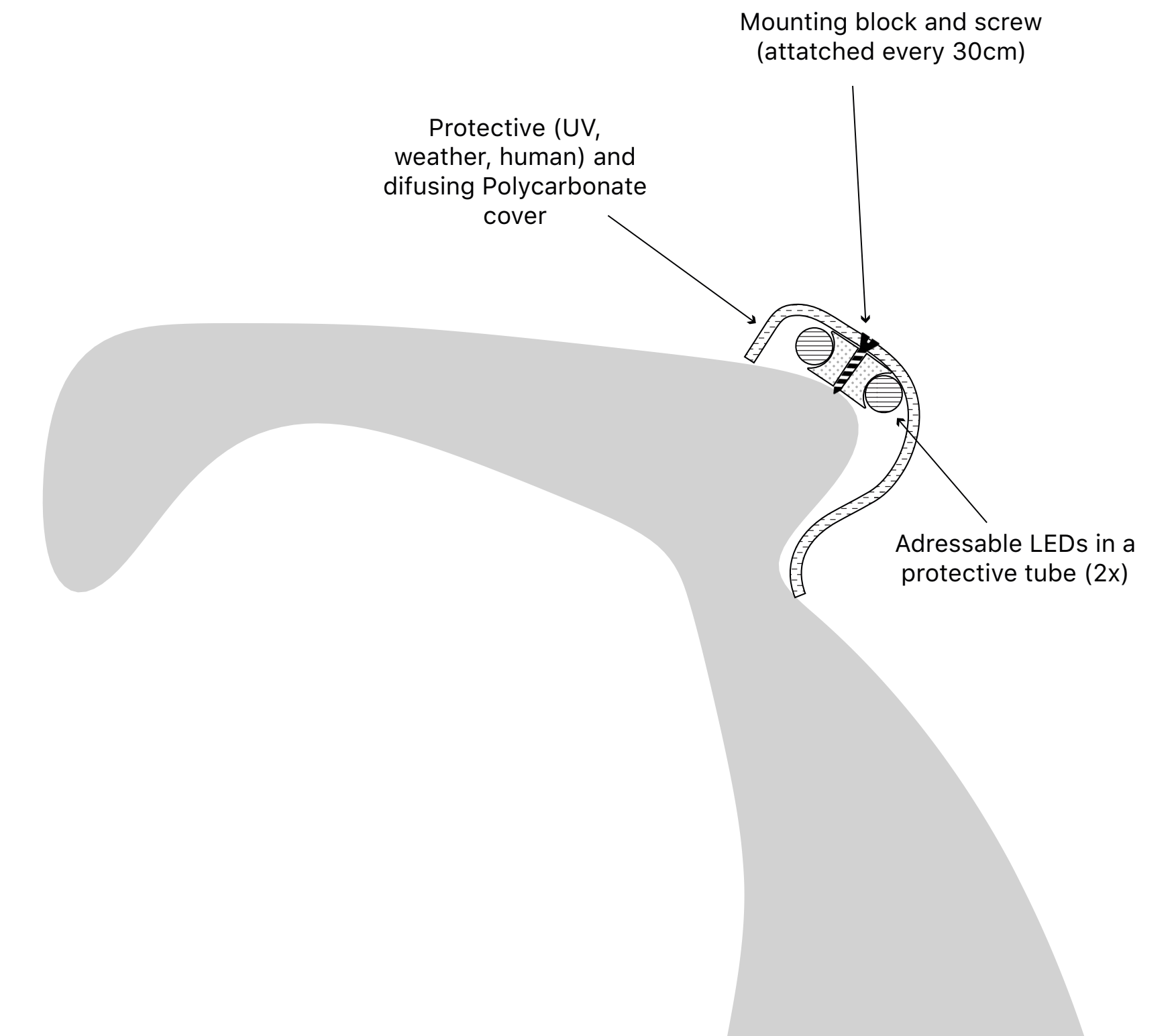
Activities

- Current activities (walking, standing still, leaning, jumping).
- Where are people standing on the bridge (currently and aggregated over time)?
- Where are people leaning on the handrail (currently and aggregated over time)?

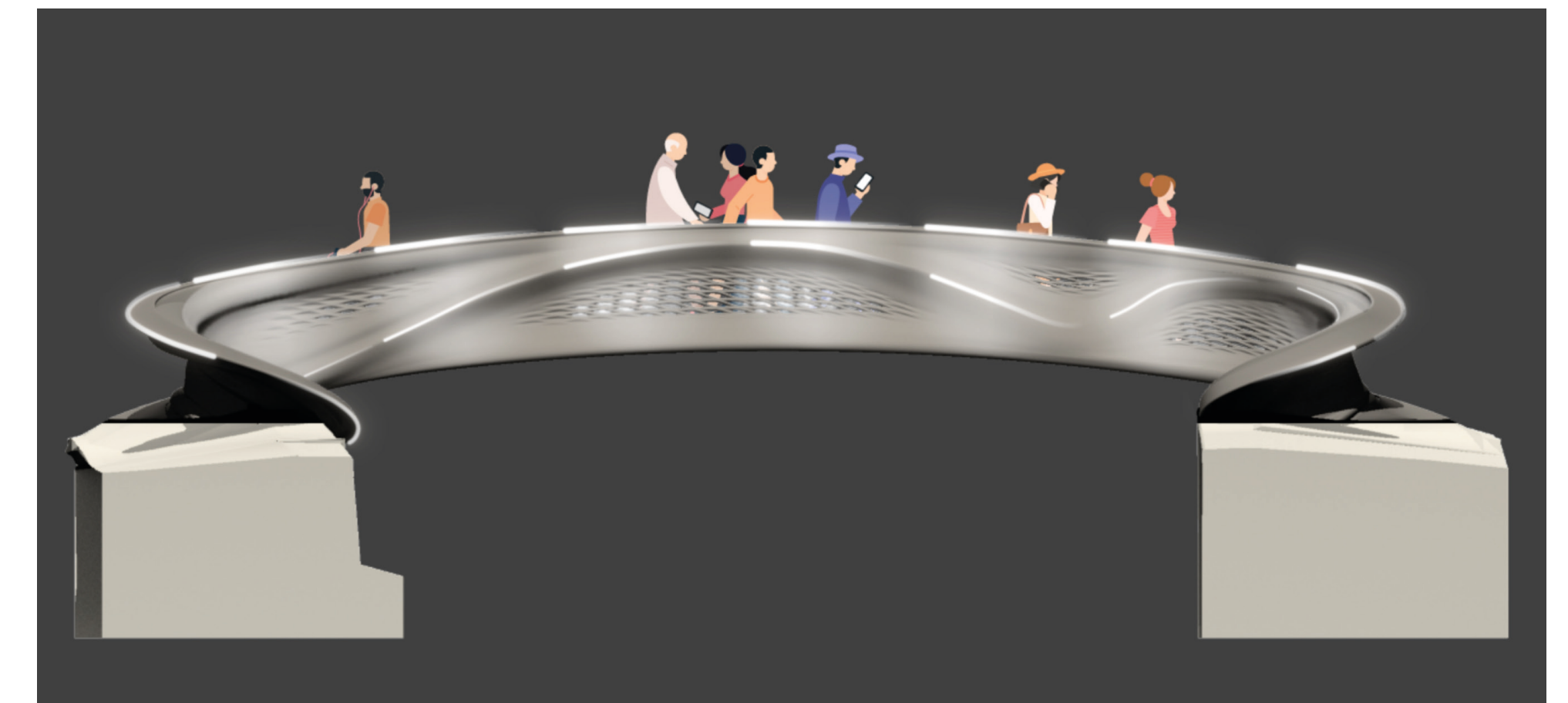
Stopping people on the bridge from standing still too long or at all by making them or the bystanders (subconsciously) aware of the problems they are causing with the use of light.

Individual behaviour

- Current location, walking direction, walking speed, and orientation of each individual.
- Current activity (walking, standing still, leaning on handrail).



The resulting solution consists out of an animation controlled by data from the bridge that elicits the feeling of movement and annoys people away who are standing still. Hardware consisting out of projection mapping and custom designed LED handrail lighting enables the animation to be displayed on the sides of the bridge and the top of the handrail.



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