

Research Through Design into Acoustic Sonification

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ABSTRACT

Acoustic Sonifications are physical objects shaped by digital datasets with the design to produce sounds that convey useful information about the dataset [1]. This installation allows hands-on explorations of three early experiments that introduce and demonstrate this concept. The installation includes iterations of each object that document the research process.

1. HRTF Bells

The first experiment, titled HRTF Bells, maps a Head Related Transfer Function (HRTF) dataset to the shape of a pair of Bells 3D printed in stainless steel. The differences in the left and right ear datasets are difficult to see, but can be heard immediately, when the bells are rung [2].



Figure 1. HRTF Bells

2. HYPERTENSION SINGING BOWL

The second experiment, titled Hypertension Singing Bowl, maps a year of blood pressure readings to the shape of a tibetan Singing Bowl that is 3D printed in stainless steel [3]. The need to represent 2 dimensional diastolic/diastolic datapoint led to a mapping that introduces tines with two levels of thickness. The bowl sings like a traditional singing bowl, but with a timbre that is changed by the dataset. Different datasets will produce bowls with different timbres.



Figure 2. Hypertension Singing Bowl

3. CHEMOTHERAPY SINGING BOWL

The third experiment, titled Chemo Singing Bowl, maps blood pressure taken over a year of chemotherapy to a Singing Bowl. This mapping aims to amplify the effect of the dataset on the acoustics of the bowl by mapping the diastolic/systolic pressure to control points for the curvature of 2D splines amped to the tines [4]. This bowl does not sing very well, possibly due to the curved shape of the tines. The subject who provided the data commented “it sounds as sick as I felt at the time”. In further iterations acoustic theory will be used to explore how to improve the singing effect.



Figure 3. Chemotherapy Singing Bowl

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4. CONCLUSION

These three experiments lay a foundation for the development of a theory of Acoustic Sonification [3]. These practice-led experiments also demonstrate design research as a method for knowledge discovery and communication in the ICAD community [4].

5. REFERENCES

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