Haptics for scientific visualisation
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ABSTRACT
Visualisations of numerical data used in the fields of maths and science are not easily accessible to visually impaired students. This paper presents the development of a multimodal system that can present graphical data in real-time. Haptic and auditory interfaces are used to enable graphs to be perceived through the senses of touch and sound. Details of the experimental procedure used to evaluate the system are given, including a comparison between different haptic devices. The results show that the system can be used to quickly and accurately obtain information from a graph in comparison with existing techniques, such as swell paper. It has been demonstrated that both haptic devices tested can be successfully used with this system, with minimal difference in performance.

Figure 1. The Force Dimension Omega (left) and Novint Falcon (right) haptic devices

Figure 2. Sonification of a graph